

## Ghanim Ullah, PhD

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### Education

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Ph.D. Computational Biophysics: Department of Physics and Astronomy, Quantitative Biology Institute, Ohio University, Advisor: Peter Jung, Aug 2006.

Thesis title: Computational modeling of calcium signaling from the nanoscale to multicellular systems.

M.Sc. Physics: University of Peshawar, Pakistan, 2000.

B.Sc. Physics and Mathematics: University of Peshawar, Pakistan, 1998.

### Professional Experience

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Professor: Department of Physics, University of South Florida, May 2024 – present.

Associate Professor: Department of Physics, University of South Florida, Aug 2018 – May 2024.

Assistant Professor: Department of Physics, University of South Florida, Aug 2013 – Aug 2018.

Postdoctoral Research Associate: Theoretical Biology and Biophysics, Los Alamos National Laboratory, Mentor: John E Pearson, Jul 2010 – June 2013.

Early Career Visitor: Mathematical Biosciences Institute, the Ohio State University, Sep 2012 – May 2013.

Postdoctoral Research Associate: Center for Neural Engineering, Department of Engineering Science and Mechanics, The Pennsylvania State University, Mentor: Steven J Schiff, Sep 2006 – Jun 2010.

Lecturer: Department of Physics, University of Peshawar, Pakistan, Feb 2001 – Jun 2001.

Lecturer: Warsak Model College, Peshawar, Pakistan, Aug 2000 – Jan 2001.

### Current and Recently Completed Projects

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(1) National Institute of Health, R01, Pending, \$3,635,752 (2025 – 2030).

Role: Co-Principal Investigator

Project: A multiscale approach to investigate the function of PIEZO channels in red blood cells and cardiac system

(2) National Science Foundation, CRCNS, Pending, \$1,873,538 (2024 – 2029).

Role: Principal Investigator

Project: CRCNS Research Proposal: The role of impaired calcium homeostasis and mitochondrial function in cardiac abnormalities in the neurodegenerative disease Friedreich Ataxia

(3) National Institute of Health, R21/R33AG087910, \$2,558,043 (2024 – 2029).

Role: Principal Investigator

Project: Investigating the aggregation of amyloid  $\beta$  during metabolic stress using multiscale modeling

(4) National Institute of Health, Grant # R01NS130916, \$503,821 (2023 – 2027).

Role: Principal Investigator

Project: Quantitative and computational dissection of glutamatergic crosstalk at tripartite synapses.

(5) National Institute of Health, Grant # R01AG053988, \$2,113,455 (2016 – 2022).

Role: Principal Investigator

Project: A multi-scale data-driven model of the Aβ pore function and Ca<sup>2+</sup> toxicity in Alzheimer's disease.

(6) USF Internal grant \$9,601 (2018).

Role: Principal Investigator

Project: To build a small computer cluster for developing multi-scale data-driven models to understand neurological disorders.

(7) American Physical Society \$15,000 (2020).

Role: Co-Investigator (Co-Organizer)

Project: To host the Conference for Undergraduate Women in Physics in 2020 at University of South Florida.

## Publications

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1. Jansen-Grabowski A, van Soest I, Guzman R, Gensch T, **Ullah G**, and Fahlke C, Transport processes associated with lysosomal chloride and proton accumulation, to be submitted.
2. Umar A R, Liodyno M, **Ullah G**, Busciglio J, and Demuro A, Down Syndrome-affected human cortical astrocytes exhibit impaired IP<sub>3</sub>-dependent Ca<sup>2+</sup> signaling and bioenergetics, to be submitted.
3. Bhattarai A, Meyer J, Petersilie L, Shah S I, Rose C R, Ullah G. A deep learning-based segmentation of cells and analysis (DL-SCAN), submitted.
4. Akter S, Ullah G, and Ullah A. Investigating the role of inositol 1,4,5-trisphosphate receptors in the pathogenesis of Alzheimer's disease through computational modeling, submitted.
5. Adeoye T, Shah S I, and Ullah G. Systematic analysis of biological processes reveals gene co-expression modules driving pathway dysregulation in Alzheimer's disease, *Aging and Disease* (2024).
6. Fajemisin J A, Gonzalez G, Rosenberg S A, Ullah G, Redler G, Latifi K, Moros E G, El Naqa I. Magnetic Resonance-guided Cancer Therapy Radiomics and Machine Learning Models for Response Prediction, *Tomography* (2024) 10(9) 1439-1454.
7. Passlick S, Ullah G, and Henneberger C. Bidirectional dysregulation of synaptic glutamate signaling after transient metabolic failure, *eLife* (2024).
8. Ullah G, Nosyreva E, and Syeda R, Piezo1 channel gate in sub-conductance levels with pressure- and voltage-dependent occupancies, *Journal of Biological Chemistry* (2024) 300(4) 107156.
9. Shah S I, Parker I, **Ullah G**, and Demuro A, Aβ<sub>40</sub> and Aβ<sub>42</sub> oligomers form transient and persistent pores different time evolutions and toxicities, Submitted DOI <https://doi.org/10.1101/2022.04.29.490101>.
10. Everaerts K, Thapalyia P, Durry S, Pape N, Eitelmann S, Roussa E, **Ullah G**, and Rose C. R, Inward operation of NBCe1 upon brief chemical ischemia promotes astrocytic Na<sup>+</sup> loading and loss of ATP in mouse neocortex, *Cells* (2023) 12(23) 2675.
11. Shah S I, Parker I, Demuro A, **Ullah G**, Modeling the kinetics of amyloid beta pores and long-term evolution of their Ca<sup>2+</sup> toxicity, *bioRxiv* (2022) DOI: <https://doi.org/10.1101/2022.05.02.490365>.
12. Kolen B, Kortzak D, Borghans B, Hannack C, Guzman R, **Ullah G**, and Fahlke C. Vesicular glutamate transporters are H<sup>+</sup>-anion exchangers that operate at variable stoichiometry, *Nature Communications* (2023) 14:2723.
13. Thapaliya P, Pape N, Rose C R, and **Ullah G**. Modeling the heterogeneity of sodium and calcium

- homeostasis between cortical and hippocampal astrocytes and its impact on bioenergetics, *Frontiers in Cellular Neuroscience* (2023) 17:1035553.
14. Pensalfini A, Umar A R, Glabe C, Parker I, **Ullah G**, Demuro A. Intracellular injection of brain extracts from Alzheimer's disease patients trigger unregulated Ca<sup>2+</sup> release from intracellular stores that hinders cellular bioenergetics, *Cells* (2022) 11(22) 3630.
  15. Adeoye T, Shah S I, Demuro A, Rabson D A, and **Ullah G**. Upregulated Ca<sup>2+</sup> release from the endoplasmic reticulum leads to impaired presynaptic function in Alzheimer's disease, *Cells* (2022) 11(14) 2167.
  16. Kanithi M, Junapudi S, Shah S I, Alavala M R, **Ullah G**, Chidipi B. Alterations of mitochondrial network by cigarette and e-cigarette vaping, *Cells* (2022) 11(10) 1688.
  17. Andrew R D, Farkas E, Hartings J A, Brennan K C, Herreras O, Müller M, Kirov S A, Ayata C, Ollen-Bittle N, Reiffurth C, Revah O, Robertson R M, Dawson-Scully K D, **Ullah G**, Shuttleworth C W, Dreier J P. Questioning glutamate excitotoxicity in acute brain damage: the importance of spreading depolarization, *Neurocritical Care* (2022) 37, 11-30.
  18. Andrew R D, Hartings J A, Ayata C, Brennan K C, Dawson-Scully K D, Farkas E, Herreras O, Kirov S A, Müller M, Ollen-Bittle N, Reiffurth C, Revah O, Robertson R M, Shuttleworth C W, **Ullah G**, Dreier J P. The critical role of spreading depolarizations in early brain injury: consensus and contention, *Neurocritical Care* (2022) 37, 83-101.
  19. Chidipi B, Mariana B A, Shah S I, Rieser M, **Ullah G**, McDonald T V, and Noujaim S F. The dynamin-related protein 1 is decreases and the mitochondrial network is altered in friedreich's ataxia cardiomyopathy, *The International Journal of Biochemistry and Cell Biology* (2022) 143, 106137.
  20. Chidipi B, Shah S I, Reiser M, Kanithi M, Garces A, Cha B J, **Ullah G**, and Noujaim S F. All-trans retinoic acid increases DRP1 levels and promotes mitochondrial fission, *Cells* (2021) 10(5) 1202.
  21. Jansen N A, Perez C, Schenke M, van Beurden A W, Dehghani A, Voskuyl R A, Thijs R D, **Ullah G**, van den Maagdenberg A M J M, Tolner E A. Attenuated theta-gamma coupling as an early indicator of inhibitory dysfunction and seizure risk in a Dravet syndrome mouse model, *Journal of Neuroscience* (2021) 41(3) 524-537.
  22. Perez C, Felix L, Durry S, Rose C R, and **Ullah**. On the origin of ultraslow spontaneous Na<sup>+</sup> fluctuations in neurons of neonatal forebrain, *Journal of Neurophysiology* (2021) 125(2) 408-425.
  23. Shah S I and **Ullah G**, The function of mitochondrial calcium uniporter at the whole-cell and single mitochondrion levels in WT, MICU1 KO, and MICU2 KO cells, *Cells* (2020) 9, 1520.
  24. Shah S I, Ong H L, Demuro A, and **Ullah G**, PunctaSpecks: A tool for automated detection, tracking, and analysis of multiple types of fluorescently labeled biomolecules, *Cell Calcium* (2020) 102224.
  25. Miti T and **Ullah**. The role of transporters and synaptic cleft morphology in glutamate and GABA homeostasis and their effect on neuronal function, *bioRxiv* (2019) <https://doi.org/10.1101/670844>.
  26. Shah S I, Paine J, Perez C, and **Ullah G**, Mitochondrial fragmentation as a common feature among cell-degenerative diseases, *PLoS One* (2019) 14(9) e0223014.
  27. Toglia P and **Ullah G**, Mitochondrial dysfunction and role in spreading depolarization and seizure, *Journal of Computational Neuroscience* (2019) 47(2-3) 91-108.
  28. Shafiq-ul-Hassan M, Zhang G G, Latifi K, **Ullah G**, Gillies R J, and Moros E G. Computed tomography texture phantom dataset for evaluating the impact of CT imaging parameters on radiomics features, *The Cancer Imaging Archive* (2019) DOI:10.7937/TCIA.2019.4l24tz5g.

29. Perez C, Miti T, Hasecke F, Meisl G, Hoyer W, Muschol M, and **Ullah G**. Mechanism of fibril and soluble oligomer formation in amyloid beta and hen egg white lysozyme proteins, *Journal of Physical Chemistry B*, (2019) 123(27) 5678-5689.
30. Shafiq-ul-Hassan M, Zhang G G, Latifi K, **Ullah G**, Gillies R J, and Moros E G. Credence Cartridge Radiomics Phantom CT Scans with Controlled Scanning Approach, *Cancer Imaging Archive* (2018) (DOI: <http://doi.org/10.7937/TCIA.2019.4124tz5g>).
31. Shah S I, Demuro A, Mak DOD, Smith I, Parker I, Pearson JE, and **Ullah G**, TraceSpecks: A software for automated separation of signal from baseline and idealization of noisy patch-clamp and imaging data, *Biophysical Journal*, (2018) 115(1) 9-21.
32. Shah S I, Smith M, Swaminathan D, Parker I, **Ullah G**, and Demuro A, CellSpecks: A software for automated detection and analysis of functional calcium channels in live cells, *Biophysical Journal*, (2018) 115(11) 2141-2151.
33. Toglia P, Demuro A, Mak DOD, and **Ullah G**, Data-driven modeling of mitochondrial dysfunction in Alzheimer's disease, *Cell Calcium* (2018) 76, 23-35.
34. Shafiq-ul-Hassan M, Latifi K, Zhang G G, **Ullah G**, Gillies R J, Moros E G. Voxel-size and gray level normalization of CT radiomic features in lung cancer tumors, *Scientific Reports*, (2018) 8(1) 10545.
35. Miti T, Hasecke F, Perez C, Schölzel D, Gremer L, Grüning C S, Matthews G, Willbol D, Neudecker P, Heise H, **Ullah G**, Hoyer W, and Muschol M. Metastable oligomers fundamentally alter kinetics of amyloid fibril assembly, *Chemical Science* (2018) 9, 5937-5948.
36. Perez C and **Ullah G**. Reduced cooperativity of voltage-gated sodium channels in the hippocampal interneurons of aged mouse model of Alzheimer's disease, *European Biophysical Journal*, (2018) 47(5) 539-547.
37. Shafiq-ul-Hassan M, Zhang G G, Hunt D C, Latifi K, **Ullah G**, Gillies R J, Moros E G. Accounting for reconstruction kernel-induced variability in CT radiomic features using noise power spectra, *Journal of Medical Imaging*, (2017) 5(1) 011013.
38. Toglia P, **Ullah G**, and Pearson J E, Analyzing optical imaging of  $\text{Ca}^{2+}$  signals via TIRF microscopy: the limits on resolution due chemical rates and depth of the channels, *Cell Calcium*, (2017) 67:65-73.
39. Hübel N, Mahshid S Hosseini-Zare, Ziburkus J, and **Ullah G**, The role of glutamate in neuronal ion homeostasis: a case study of spreading depolarization, *PLoS Computational Biology*, (2017) 13(10) e1005804.
40. Shafiq-ul-Hassan M, Zhang G G, Latifi K, **Ullah G**, Hunt D C, Balagurunathan Y, Abdullah M A, Schabath M B, Goldgof D G, Mackin D, Court L E, Gillies R J, Moros E G. Intrinsic dependencies of CT Radiomics features on voxel size and number of gray levels, *Medical Physics*, (2017) 44(3) 1050-1062.
41. Perez C, Ziburkus J, and **Ullah G**. Analyzing and modeling the dysfunction of inhibitory neurons in Alzheimer's disease, *PLoS One* (2016) 11(12): e0168800.
42. **Ullah G** and Ullah A. Mode switching of inositol 1,4,5-trisphosphate receptor channel shapes the spatiotemporal scales of  $\text{Ca}^{2+}$  signals, *Journal of Biological Physics*, (2016) 42(4) 507-524.
43. Toglia P and **Ullah G**. The Gain-of-function enhancement of  $\text{IP}_3$ -receptor channel gating by familial Alzheimer's disease-linked presenilin mutants increases the open probability of mitochondrial permeability transition pore, *Cell Calcium* (2016) 60(2) 13-24.
44. Toglia P, Cheung KH, Mak DOD, and **Ullah G**. Impaired mitochondrial function due to familial

- Alzheimers disease causing presenilins mutants via  $\text{Ca}^{2+}$  disruptions, *Cell Calcium* (2016), 59(5) 240-250.
45. Hübel N, Andrew DR, and **Ullah G**. Large extracellular space leads to neuronal susceptibility to ischemic in  $\text{Na}^+/\text{K}^+$  pumps-dependent manner, *Journal of Computational Neuroscience* (2016), 40(2) 177-192.
  46. Hübel N and **Ullah G**. Anions govern cell volume: a case study of relative astrocytic and neuronal swelling in spreading depolarization, *PLoS One* (2016), 11(3) e0147060.
  47. Mak DOD, Cheung KH, Toglia P, Foskett JK, and **Ullah G**. Analyzing and quantifying the gain-of-function enhancement of  $\text{IP}_3$  receptor gating by Familial Alzheimer's disease-causing mutations in presenilins, *PLoS Computational Biology*, 11(10) (2015) e1004529.
  48. **Ullah G**, Demuro A, Parker I, and Pearson JE. Analyzing and modeling the kinetics of amyloid beta pores associated with Alzheimer's disease pathology, *PLoS ONE* 10(9) (2015) e0137357.
  49. **Ullah G**, Wei Y, Dahlem MA, Wechselberger M, Schiff SJ. The role of cell volume in the dynamics of seizure, spreading depression, and anoxic depolarization, *PLoS Computational Biology*, 11(8) (2015) e1004414
  50. Wei Y, **Ullah G**, Schiff SJ, Unification of neuronal spikes, seizures, and spreading depression, *Journal of Neuroscience* (2014) 11733.
  51. Wei Y, **Ullah G**, Ingram J, and Schiff SJ, Oxygen and seizure dynamics: II. Computational modeling, *Journal of Neurophysiology* (2014).
  52. Ullah A, Jung P, **Ullah G**, and Machaca K. The Role of  $\text{IP}_3$  Receptor Channel Clustering in  $\text{Ca}^{2+}$  Wave Propagation During Oocyte Maturation, *Progress in Molecular Biology and Translational Science*, 123 (2014) 83.
  53. Bruno W, **Ullah G**, Mak DOD, and Pearson JE, Automated maximum likelihood separation of signal from baseline in noisy quantal data, *Biophysical Journal*, 105 (2013) 68.
  54. Vais H, Foskett KJ, **Ullah G**, Pearson JE, and Mak DOD, Permeant calcium ion feedback regulation of single inositol 1,4,5-trisphosphate receptor channel gating, *Journal of General Physiology*, 140 (2012) 697.
  55. **Ullah G**, Mak DOD, and Pearson JE, A data-driven model of a modal gated ion channel: the inositol 1,4,5-trisphosphate receptor in insect Sf9 cell, *Journal of General Physiology*, 140 (2012) 159.
  56. **Ullah G**, Bruno W, and Pearson JE, Simplification of reversible Markov chains by removal of states with low equilibrium occupancy, *Journal of Theoretical Biology*, 311 (2012) 117.
  57. **Ullah G**, Parker I, Mak DOD, and Pearson JE, Multi-scale data-driven modeling and observation of calcium puffs, *Cell Calcium*, 52, (2012) 152.
  58. Ahmad F, **Ullah G**, and Kim SH, A neighborhood method for statistical analysis of fMRI data, *Open Journal of Biophysics*, 2(1) (2012) 15.
  59. Wei Y, **Ullah G**, Parekh R, Ziburkus J, and Schiff SJ, Kalman filter tracking of intracellular neuronal voltage and current, 50<sup>th</sup> IEEE Conference on Decision and Control and European Control Conference, (2011) 12-15.
  60. **Ullah G** and Schiff SJ, Assimilating seizure dynamics, *PLoS Computational Biology*, 6 (2010) e1000776.
  61. Sawaminathan D, **Ullah G**, and Jung P, A simple sequential-binding model for calcium puffs, *Chaos*, 19 (2009) 037109.

62. **Ullah G** and Schiff SJ, Tracking and control of neuronal Hodgkin-Huxley dynamics, *Physical Review E*, 79 (2009) 040901.
63. **Ullah G**, Cressman JR, Barreto E, and Schiff SJ, The influence of sodium and potassium dynamics on excitability, seizures, and the stability of persistent states: II. Network and glial dynamics, *Journal of Computational Neuroscience*, 26 (2009) 171.
64. Cressman JR, **Ullah G**, Ziburkus J, Barreto E, and Schiff SJ, The influence of sodium and potassium dynamics on excitability, seizures, and the stability of persistent states: I. Single neuron dynamics, *Journal of Computational Neuroscience*, 26 (2009) 159.
65. **Ullah G** and Schiff SJ, Models of epilepsy, *Scholarpedia*, 4(7) (2009) 1409.
66. **Ullah G**, Jung P, and Machaca K, Modeling calcium signaling differentiation during oocyte maturation, *Cell Calcium*, 42 (2007) 556.
67. **Ullah G** and Peter Jung, Modeling the statistics of elementary calcium release events *Biophysical Journal*, 90 (2006) 3485.
68. **Ullah G**, Jung P, and Cornell-Bell AH, Anti-phase calcium oscillations in astrocytes via inositol 1,4,5-trisphosphate regeneration, *Cell Calcium*, 39 (2006) 197.
69. Jung P, Neiman AB, Afghan MKN, Nadkarni S, **Ullah G**, Thermal activation by power-limited colored noise, *New Journal of Physics*, 7 (2005) 17.

### **Honors and Awards**

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Jewell Physics Faculty Excellence Award, University of South Florida, 2023

Mercator Fellowship from German Research Foundation, 2022-2024.

Faculty Outstanding Research Achievement Award, University of South Florida, 2017.

NSF Early Career Visitor Award from Mathematical Biosciences Institute, the Ohio State University, 2012-2013.

Recipient of University gold medal for the best Master of Physics student during two consecutive years in the University of Peshawar, Pakistan, 2000.

Won Oriental Physics Award (awarded to top Physics students in Pakistan), 2000.

### **Services**

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Academic Editor: PLoS One

Topic Editor: Cells

Recurrent reviewer for several funding agencies including NIH, NSF, Natural Sciences and Engineering Research Council of Canada, Veni Netherlands, Telethon Foundation Italy, The Netherlands Organization for Scientific Research, the National Science Center Poland.

Reviewer for many journals including *Cell Calcium*, *Physical Biology*, *Nanoscale Research Letters*, *Journal of Cell Biology*, *Chaos*, *International Journal of Neuroscience*, *Journal of Neural Engineering*, *Concepts in Magnetic Resonance*, *Journal of Biological Physics*, *Epilepsy Research*, *Journal of Computational Neuroscience*, *Cognitive Neurodynamics*, *PeerJ*, *Europhysics Letters*, *Mathematical Biosciences*, *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*, *Journal of Neurophysiology*, *Molecular Psychiatry*, *PLoS One*, *Physics Letters A*, *Biological Cybernetics*, *Computational and Mathematical Methods in Medicine*, *Journal of Theoretical Biology*, *International Journal of Neural Systems*, *Biophysical Journal*, *PLoS Computational Biology*, *Biomedical Optics Express*, *Chaos*, *Solitons, & Fractals*, *Applied Mathematical Modelling*, *Neural Computing and*

Modeling, The Open Neurology Journal, International Journal of Computational Methods, Biofabrication, eLife, International Journal of Structural and Computational Biology, Journal of Raman Spectroscopy, Journal of Biophotonics, Neuronal Networks, the Open Neurology Journal, Neural Regeneration Research.

Senator at USF Faculty Senate, 09/2022- present

Member of USF Physics Committee for Department Website Development, 09/2022-present

Member of USF Physics Faculty Advisory Committee, 08/2018-05/2021 and 09/2023-present

Chair, Information, Computing, and Communication Core of USF Pandemic Response Research Network, 2020 – 2021

Member of USF Physics, Mathematics, and Engineering Committee for Developing Quantum Computing Curriculum, 02/2021-08/2021

Member of USF Physics Committee for Developing ML and Computational Physics Track, 08/2021-11/2021

Member of USF Physics Committee Developing Biophysics Track, 01/2020-11/2020

Member of USF Physics Graduate Committee, 08/2016-present

Member of USF Physics Research Advisory Group, 02/2019-present

Member of USF College of Arts and Science Computer Committee, 08/2015-08/2022

Member of USF School of Natural Sciences and Mathematics committee to develop curriculum for interdisciplinary graduate degree program in computational sciences, 08/2013 – 05/2016.

Member of USF Physics Graduate Admission Committee, 08/2015-08/2016

Member of USF Physics Undergraduate Committee, 08/2014-08/2015

Member of USF Biophysics Strategic Planning Committee, 08/2014-08/2015

Member of USF Theoretical, Computational, and Mathematical Physics Strategic Planning Committee, 08/2014-08/2015

Judge at the Ohio State Science Fair, Ohio State University, 2004.

Organizer of Science Society, University of Peshawar, Pakistan, 1998 - 2000.

## **Teaching**

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### Courses Taught

1. Applications of Physics to Biology and Medicine I (Undergraduate level, Course # PHY 4702), Fall 2023.
2. Applications of Physics to Biology and Medicine II (Undergraduate level, Course # PHY 4703), taught twice in Fall 2022 and Spring 2023.
3. Machine Learning (Undergraduate level, Course # PHY 4936), taught twice in Spring 2022 and Spring 2024.
4. Machine Learning (Graduate level, Course # PHY 5937), taught twice in Spring 2022 and Spring 2024.
5. General Physics I (w\Calculus) (Undergraduate level, Course # PHY 2048), Spring 2017.
6. Computational Physics (Undergraduate level, Course # PHZ 4151C), taught seven times since 2013.

7. Introduction to Computational Physics (PhD level, Course # PHZ 5154C), taught seven times since 2013.
8. Advanced Computational Physics (PhD level, Course # PHZ 5156C), taught five times since 2014.
9. Mathematical Methods in Physics (Undergraduate level, Course # PHZ 3113), taught six times since 2016.
10. General Physics I (w\Algebra) (Undergraduate level, Course # PHY 2053), Summer 2014.
11. Neural Control Engineering (PhD level), taught at the Pennsylvania State University, Fall 2009.

#### Online Courses Developed and Taught

12. Computational Physics (Undergraduate level, Course # PHZ 4151C), developed in Summer 2016, taught in Fall 2016.
13. Online Course on Introduction to Computational Physics (PhD level, Course # PHZ 5154C), developed in Summer 2016, taught in Fall 2016.

#### Courses Taught Before USF

14. Thermal and Statistical Physics (Undergraduate level, Fall 2000)
15. Special Topics in Nuclear Physics (Undergraduate level, Spring 2001)
16. Algebra and Calculus Based Physics Courses to High School Students (9<sup>th</sup> to 12<sup>th</sup> grades)

#### **Students Advised**

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##### Current Students (USF)

1. Pawan Kumar Thapaliya, Physics PhD Candidate (Fall 2019 – present)
2. Alok Bhattarai, Physics PhD Candidate (Fall 2019 – present)
3. Abdul Rahim Umar, Physics PhD Candidate (Fall 2018 – present)
4. Temitope Adeoye, Physics PhD Candidate (Fall 2019 – present)
5. Laura F De Oliveria, Physics PhD Candidate (Spring 2024 – present)
6. Diego A Hernandez, Medical Physics PhD Candidate (Fall 2023 – present)
7. Jesutofunmi Fajemisin, Medical Physics PhD Candidate (Fall 2023 – present)
8. Jacob Moriarty, Medical Physics PhD Candidate (Spring 2024 – present)
9. Michael Agustin Mateo, Medical Physics PhD Candidate (Fall 2020 – present)

##### Alumni (USF)

##### Postdocs and Graduate Students

1. Nour Nasser, Medical Physics PhD Candidate (Fall 2019 – Spring 2024)
2. Jihye Koo, Medical Physics PhD (Fall 2017 – Spring 2023)
3. Ayomide Alabi, Physics M.S. (Fall 2022 – Spring 2023)
4. Syed Islamuddin Shah, Postdoctoral Researcher (July 2017 - March 2021)
5. Tatiana Miti, Postdoctoral Researcher (March 2018 – Sep 2020)
6. Carlos Perez, Physics PhD (Summer 2015 – Fall 2020)



7. Qixing Han, Medical Physics M.S. (Fall 2017 – Spring 2020)
8. Christopher Tichacek, Medical Physics PhD (Summer 2015 – Fall 2019)
9. Niklas Hübel, PhD, Postdoctoral Researcher (Mar 2015 - Summer 2016)
10. Patrick Toglia, Physics PhD (Fall 2013 – Spring 2018)
11. Muhammad Shafiq-Ul-Hassan, Medical Physics PhD (Spring 2016 – Spring 2018)
12. Saeed Ahmad, Medical Physics PhD (Spring 2016 – Spring 2019)
13. Michael Fasano, Physics M.S. (Spring 2014 – Spring 2018)
14. Francisco Santos, Physics M.S. (Fall 2015 – Spring 2018)
15. Kars Veldkamp, MS Intern from University of Twente Netherlands (May 2021 - Nov 2021).

### Undergraduate Students

1. Stefan Feier, Physics Undergraduate (Summer 2022 – Present)
2. Emily E Van Wiele, Physics Undergraduate, University of Tampa (Summer 2024 – Present)
3. Devin Gainer, Physics Undergraduate (Spring 2023 – Fall 2023)
4. Eric Hornfeck, Physics Undergraduate (Spring 2023 – Fall 2023)
5. Caroline Ward, Physics REU student from The College of Wooster, OH (Summer 2022)
6. Tyler Hull, Physics Undergraduate (Spring 2021 - Spring 2022)
7. Anthony Gifford, Physics Undergraduate (Fall 2021 - Spring 2022)
8. Zenzele Thomas, Physics Undergraduate (Fall 2021 - Spring 2022)
9. Chase Ruff, Physics Undergraduate (Spring 2020 - Fall 2022)
10. Alexi J Agosto, Physics Undergraduate (Fall 2020 - Fall 2022)
11. Ethan H Fleming, Physics REU student from Middlebury College, VT (Summer 2021)
12. William Pante, Physics Undergraduate (Spring 2019 - Spring 2020)
13. Rosario Hernandez, Undergraduate Physics REU student from Southwester University, TX (Summer 2019)
14. Colin Trevor Huntley, Physics Undergraduate (Summer 2019 - Spring 2020)
15. John Zhou, Physics Undergraduate (Spring 2019 - Fall 2019)
16. Grace Lloyd, Cellular and Molecular Biology Undergraduate (Spring 2018 – Spring 2019)
17. Kai Raymond, Physics Undergraduate (Fall 2018 – Spring 2019)
18. Alexander Attir, Physics Undergraduate (Fall 2018 – Spring 2019)
19. Johanna Paine, Undergraduate Physics REU student from California Lutheran University, CA (Summer 2018)
20. Joshua Townsend, Physics Undergraduate (Spring 2017 – Spring 2018)
21. Benjamin Gross, Physics Undergraduate (Spring 2017 – Spring 2018)

22. Sanim Rahman, Chemical Engineering Undergraduate (Spring 2017 – Spring 2018)
23. Robert Sprague, Physics Undergraduate (Fall 2017 – Spring 2018)
24. Anthony K Clear, Undergraduate Physics REU student from King University, TN (Summer 2017)
25. Emma Stephan, High School Student (05/2017 – 09/2017)
26. Branton Huffstutler, Physics Undergraduate (Fall 2014 – Fall 2016)
27. Evan Little, Physics Undergraduate (Spring 2016 – Winter 2016)
28. Tyler Iorizzo, Physics Undergraduate (Summer 2015 – Fall 2016)
29. Coulton Johnson, Undergraduate Physics (Fall 2015- Summer 2016)
30. Samuel Montgomery, Undergraduate Physics REU student from New Mexico Tech (Summer 2015)
31. Thatcher Moss, Undergraduate Physics (Summer 2015)
32. Daniel Bonilla, Undergraduate Physics (Fall 2015)
33. Robert Logan, Undergraduate Physics (Fall 2013 - Spring 2015)
34. Corey Bathurst, Undergraduate Physics (Fall 2013 - Summer 2014)
35. Catharine Shipps, Undergraduate Physics REU student from Ohio State University (Summer 2015)
36. Danish Hasan, Undergraduate Biomedical Sciences (Fall 2014 - Spring 2015)
37. Alexander Sidhom, Undergraduate Biomedical Sciences (Fall 2014 - Spring 2015)

Alumni (Co-advised at the Pennsylvania State University):

1. Yina Wei, PhD in Neural Engineering (Fall 2007 - Spring 2013)

Member of the PhD thesis committees:

1. Nabila Bushra, Department of Physics
2. Hafiza Zahra Rab, Department of Chemistry
3. Noha Alzahrani, Department of Physics
4. Abdulhakim Alsaif, Department of Electrical Engineering
5. Ali Aljumah, Department of Electrical Engineering
6. Chamani Niyangoda, Department of Physics
7. Jason Mast, Department of Physics
8. Jeremy Barton, Department of Physics
9. Aryal Chinta, Department of Physics
10. Liang Pengfei, Department of Physics
11. James Kruczek, Department of Physics
12. Baderaldeen Altazi, Department of Physics, Moffitt Cancer Center (graduated 2017)
13. Tatiana Miti, Department of Physics (graduated 2017)

14. Aman Chawla, Department of Electrical Engineering (graduated 2017)

15. Mentor Mulaj, Department of Physics (graduated 2016)

### **Conferences/Workshops Organized**

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1. Co-organized APS Conference for Undergraduate Women in Physics at USF, 2020
2. Organized a two-day workshop under Biophysical Society's International Biophysics Week, 2021
3. Organized a two-day workshop on "Ca<sup>2+</sup> Signaling in Health and Disease" at National University of Science and Technology, Pakistan, 2022
4. Organized a one-day Symposium on "Computational Methods in Biophysics" at Quaid-e-Azam University, Pakistan, 2023