



# Waleed Abdallah

## *Curriculum Vitae*

### Personal Data

Full name Waleed Mohammed Abdallah Mohammed  
Affiliations Faculty of Science, Cairo University, Giza, Egypt.  
Date of birth 05/02/1984  
Gender Male  
Nationality Egyptian  
Marital status Married  
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### Academic Positions

Jun. 2017 – **Lecturer (Assistant Professor)**, *Faculty of Science, Cairo University, Giza, Egypt.*  
present  
March 2018 – **Post-doctoral fellow**, *Physics Division, Harish-Chandra Research Institute (HRI), Allahabad, India.*  
March 2021  
Feb. 2012 – **Research Assistant**, *Center for Fundamental Physics, Institute of Basic Sciences, Zewail City of Science and Technology, Giza, Egypt.*  
Feb. 2018  
Jun. 2013 – **Lecturer Assistant**, *Faculty of Science, Cairo University, Giza, Egypt.*  
May 2017  
Dec. 2010 – **Research Assistant**, *Center for Theoretical Physics, British University in Egypt.*  
Jan. 2012  
Jun. 2010 – **Demonstrator**, *Faculty of Science, Cairo University, Giza, Egypt.*  
May 2013  
Sep. 2008 – **Demonstrator**, *Faculty of Education, Helwan University, Helwan, Egypt.*  
May 2010  
Aug. 2006 – **Teacher of Mathematics**, *Nobel Language School, Mokattam, Cairo, Egypt.*  
May 2007

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## Doctoral Thesis

Title Dark Matter and Cosmological Implications of Supersymmetric Models  
Supervisors Prof. Shaaban Khalil (Zewail City) and Prof. Ahmed Amer (Cairo University)  
External Prof. Steve King (University of Southampton) and Prof. Steven Abel (Durham  
examiners University)

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## Master Thesis

Title Electroweak Baryogenesis in  $B - L$  Extension of The Standard Model.  
Supervisors Prof. Shaaban Khalil (Zewail City) and Prof. Ahmed Amer (Cairo University)  
External Prof. Stefano Moretti (University of Southampton)  
examiner

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## Education

May 2013 – **Doctor of Philosophy**, *Modern Applied Mathematics (Theoretical Physics)*, Mathematics Department, Faculty of Science, Cairo University, Giza, Egypt.  
May 2017  
Nov. 2010 – **Master of Science**, *Modern Applied Mathematics (Theoretical Physics)*, Mathematics Department, Faculty of Science, Cairo University, Giza, Egypt.  
Apr. 2013  
Sep. 2009 – **Pre-Master**, *Modern Applied Mathematics*, Mathematics Department, Faculty of Science, Cairo University, Giza, Egypt.  
June 2010  
Sep. 2007 – **Bachelor of Science**, *Applied Mathematics (Theoretical Physics)*, Mathematics Department, Faculty of Science, Cairo University, Giza, Egypt.  
May 2009  
Sep. 2007 – **Special Diploma of Teacher Preparation in Mathematics**, *Applied Mathematics*, Mathematics Department, Faculty of Education, Ain Shams University, Cairo, Egypt.  
May 2008  
Sep. 2006 – **General Diploma of Teacher Preparation in Mathematics**, *Applied Mathematics*, Mathematics Department, Faculty of Education, Ain Shams University, Cairo, Egypt.  
May 2007  
Sep. 2002 – **Bachelor of Science and Education**, Mathematics Department, Faculty of Education, Helwan University, Helwan, Egypt.  
May 2006

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## Teaching Experiences

Feb. 2022 – Dr. Abdallah taught Newtonian Mechanics I, Analytical Mechanics I and Quantum  
Jun. 2022 Mechanics II at Mathematics Department, Faculty of Science, Cairo University, Egypt.  
Sep. 2021 – Dr. Abdallah taught Quantum Mechanics I and Calculus I at Mathematics Department,  
Jan. 2022 Faculty of Science, Cairo University, Egypt.  
Apr. 2021 – Dr. Abdallah taught Newtonian Mechanics I and Quantum Mechanics II at Mathematics Department, Faculty of Science, Cairo University, Egypt.  
Jun. 2021  
Sep. 2017 – Dr. Abdallah taught Quantum Mechanics II at Mathematics Department, Faculty of Science, Cairo University, Egypt.  
Jan. 2018  
Jun. 2014 – Dr. Abdallah taught a Short Course on the Standard Model for Particle Physicists in the Center for Fundamental Physics at Zewail City of Science and Technology, Egypt.  
July 2014

Sep. 2012 – Dr. Abdallah taught Quantum Mechanics I and II under supervision of Prof. Ahmed  
 Jan. 2014 Amer at Mathematics Department, Faculty of Science, Cairo University, Egypt.  
 During M.Sc. Dr. Abdallah was a teaching assistant for Quantum Mechanics I and II, Analytical  
 Mechanics, Complex Analysis, Mathematical Methods, Ordinary Differential Equations  
 and Calculus at Mathematics Department, Faculty of Science, Cairo University, Egypt.

## Research Interests

Phenomenology of High Energy Physics, Astroparticle Physics, Physics at the Large  
 Hadron Collider and Neutrino Physics

## Ph.D. and M.Sc. Supervision

**Ahmed Raafat Mohamed**, M.Sc. titled "New physics beyond the Standard Model  
 in light of recent Fermilab experimental measurements", registered at Ain Shams  
 University in February 2022.

## Computer Skills

Operating Systems macOS, Unix, Linux and Windows.  
 Platforms macOS Big Sur, Ubuntu, Scientific Linux and Windows.  
 Languages C, C++, Mathematica, MATLAB, Maple, Python, Fortran, shell scripting.  
 Physics Packages & HEP Tools SARAH, CalcHEP, SSP/xBit, SPheno, HiggsBounds, HiggsSignals, micrOMEGAs,  
 NMSSMTools, MadGraph, PYTHIA, Delphes, MadAnalysis 5 and CheckMATE.

## Languages

Arabic Mother Tongue  
 English 2<sup>nd</sup> language, excellent reading and writing, and very good speaking

## Fellowships

Mar. 2018 – Postdoctoral Fellowship from Physics Division, Harish-Chandra Research Institute  
 Mar. 2021 (HRI), Allahabad, India.  
 Feb. 2014 – Ph.D. Fellowship from the Centre for Fundamental Physics at Zewail City of Science  
 Aug. 2017 and Technology, Giza, Egypt.  
 Feb. 2012 – M.Sc. Fellowship from the Centre for Fundamental Physics at Zewail City of Science  
 Jan. 2014 and Technology, Giza, Egypt.  
 Dec. 2010 – M.Sc. Fellowship from the Centre for Theoretical Physics, the British University in  
 Jan. 2012 Egypt.

## Awards and Research Visits

Dec. 23, 2019 – Research visit to Center for Fundamental Physics (CFP) at Zewail City of Science  
 Jan. 17, 2020 and technology, Giza, Egypt.  
 Dec. 2019 International Publication Award for 2018, Cairo University, Giza, Egypt.

- Dec. 19 – 30, Research visit to Physics and Applied Mathematics Unit, Indian Statistical Institute, 2018 Kolkata, India.
- July 2018 International Publication Award for 2017, Cairo University, Giza, Egypt.
- July 15 – Research visit to IFT at the Universidad Autónoma de Madrid (UAM), Spain under  
Aug. 15, 2017 the InvisiblesPlus Research and Innovation Staff Exchange (RISE) scheme.
- July 2017 International Publication Award for 2016, Cairo University, Giza, Egypt.
- Oct. 15 – Research visit to DESY Theory Group, Hamburg, Germany under STDF German-  
Nov. 13, 2016 Egyptian Mobility Project GE-SEED 18448.
- July 2016 International Publication Award for 2015, Cairo University, Giza, Egypt.
- Sep. 2015 Research visit to the European Organization for Nuclear Research (CERN), Geneva, Switzerland.
- Feb. 2015 The Achievement Award in Appreciation of my Contribution at the Center for Fundamental Physics in Zewail City of Science and Technology, Giza, Egypt.
- Oct. 2014 Misr Elkhir Publication Award for 2013, Egypt.
- June 2014 International Publication Award for 2013, Cairo University, Giza, Egypt.
- Aug. 2010 – Research visits (three times) to the International Center for Theoretical Physics  
Sep. 2012 (ICTP), Trieste, Italy under the Federation Scheme, (August 14–31, 2010), (January 14–29, 2012) and (September 11–25, 2012).
- Mar. 2010 Ali Moustafa Mosharafa Award for 2009 from Faculty of Science, Cairo University, Giza, Egypt.

## Memberships

- Apr. 2016 – Member of the European Union's Horizon 2020 ITN project (H2020-MSCA-ITN-  
Dec. 2020 2015-674896-ELUSIVES).
- Feb. 2016 – Member of the European Union's Horizon 2020 RISE project (H2020-MSCA-RISE-  
Dec. 2020 2015-690575-InvisiblesPlus).
- Mar. 2016 – Member of STDF project ID 13858 on Quantum Gravity and String Theory.  
Feb. 2018
- June 2015 – Member of the grant H2020-MSCA-RISE-2014 no. 645722 (NonMinimalHiggs).  
Feb. 2018
- Jan. 2015 – Member in the Theoretical High Energy Physics Node in the Egyptian Network for  
Feb. 2018 High Energy Physics (ENHEP) at the CMS experiment.
- Apr. 2012 – Member of the European Union FP7 ITN project (Marie Curie Actions, PITN-GA-  
Mar. 2016 2011-289442-INVISIBLES).
- Feb. 2012 – Member of the International Center for Theoretical Physics (ICTP) grant AC-80.  
Aug. 2017
- Dec. 2010 – Member of the International Center for Theoretical Physics (ICTP) grant AC-30.  
Feb. 2012

Author names are listed in alphabetical order according to High Energy Physics publishing standards.  
For my full list of publications, please visit this link:

<https://inspirehep.net/authors/1273820?ui-citation-summary=true>

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## List of Publications in Refereed Journals

- [1] W. Abdallah, R. Gandhi and S. Roy, “Requirements on common solutions to the LSND and MiniBooNE excesses: a post-MicroBooNE study,” JHEP **06**, 160 (2022) [arXiv:2202.09373 [hep-ph]].
- [2] W. Abdallah, A. K. Barik, S. K. Rai and T. Samui, “Search for a light  $Z'$  at LHC in a neutrinophilic  $U(1)$  model,” Phys. Rev. D **104**, 095031 (2021) [arXiv:2106.01362 [hep-ph]].
- [3] W. Abdallah, R. Gandhi and S. Roy, “Two-Higgs doublet solution to the LSND, MiniBooNE and muon  $g - 2$  anomalies,” Phys. Rev. D **104**, 055028 (2021) [arXiv:2010.06159 [hep-ph]].
- [4] W. Abdallah, A. Datta and S. Roy, “A relatively light, highly bino-like dark matter in the  $Z_3$ -symmetric NMSSM and recent LHC searches,” JHEP **04**, 122 (2021) [arXiv:2012.04026 [hep-ph]].
- [5] W. Abdallah, R. Gandhi and S. Roy, “Understanding the MiniBooNE and the muon and electron  $g - 2$  anomalies with a light  $Z'$  and a second Higgs doublet,” JHEP **12**, 188 (2020) [arXiv:2006.01948 [hep-ph]].
- [6] W. Abdallah, A. Kumar and A. K. Saha, “Soft leptogenesis in the NMSSM with a singlet right-handed neutrino superfield,” JHEP **04**, 065 (2020) [arXiv:1911.03363 [hep-ph]].
- [7] W. Abdallah, A. Hammad, S. Khalil and S. Moretti, “Dark Matter Spin Characterisation in Mono- $Z$  Channels,” Phys. Rev. D **100**, 095006 (2019) [arXiv:1907.08358 [hep-ph]].
- [8] W. Abdallah, A. Chatterjee and A. Datta, “Revisiting singlino dark matter of the natural  $Z_3$ -symmetric NMSSM in the light of LHC,” JHEP **1909**, 095 (2019) [arXiv:1907.06270 [hep-ph]].
- [9] W. Abdallah, S. Choubey and S. Khan, “FIMP dark matter candidate(s) in a  $B - L$  model with inverse seesaw mechanism,” JHEP **1906**, 095 (2019) [arXiv:1904.10015 [hep-ph]].
- [10] W. Abdallah, A. Hammad, S. Khalil and S. Moretti, “Searching for Charged Higgs Bosons in the  $B - L$  Supersymmetric Standard Model at the High Luminosity Large Hadron Collider,” Phys. Lett. B **788**, 65 (2019) [arXiv:1806.03585 [hep-ph]].
- [11] W. Abdallah, A. Hammad, A. Kasem and S. Khalil, “Long-lived  $B - L$  symmetric SSM particles at the LHC,” Phys. Rev. D **98**, 095019 (2018) [arXiv:1804.09778 [hep-ph]].
- [12] W. Abdallah, S. Khalil, S. Moretti and S. Munir, “Closing in on the Wino LSP via trilepton searches at the LHC,” JHEP **01**, 155 (2018) [arXiv:1710.05536 [hep-ph]].
- [13] W. Abdallah and S. Khalil, “Dark Matter in  $B - L$  Supersymmetric Standard Model with Inverse Seesaw,” JCAP **04**, 016 (2017) [arXiv:1701.04436 [hep-ph]].

- [14] W. Abdallah, A. Hammad, S. Khalil and S. Moretti, “Search for Mono-Higgs Signals at the LHC in the  $B - L$  Supersymmetric Standard Model,” Phys. Rev. D **95**, 055019 (2017) [arXiv:1608.07500 [hep-ph]].
- [15] W. Abdallah, J. Fiaschi, S. Khalil and S. Moretti, “Mono-jet, -photon and -Z Signals of a Supersymmetric ( $B - L$ ) Model at the Large Hadron Collider,” JHEP **02**, 157 (2016) [arXiv:1510.06475 [hep-ph]].
- [16] W. Abdallah and S. Khalil, “MSSM Dark Matter in Light of Higgs and LUX Results,” Adv. High Energy Phys. **2016**, 5687463 (2016) [arXiv:1509.07031 [hep-ph]].
- [17] W. Abdallah, J. Fiaschi, S. Khalil and S. Moretti, “ $Z'$ -induced Invisible Right-handed Sneutrino Decays at the LHC,” Phys. Rev. D **92**, 055029 (2015) [arXiv:1504.01761 [hep-ph]].
- [18] W. Abdallah, S. Khalil and S. Moretti, “Double Higgs Peak in the Minimal SUSY  $B - L$  Model,” Phys. Rev. D **91**, 014001 (2015) [arXiv:1409.7837 [hep-ph]].
- [19] W. Abdallah, D. Delepine and S. Khalil, “TeV Scale Leptogenesis in  $B - L$  Model with Alternative Cosmologies,” Phys. Lett. B **725**, 361 (2013) [arXiv:1205.1503 [hep-ph]].
- [20] W. Abdallah, A. Awad, S. Khalil and H. Okada, “Muon Anomalous Magnetic Moment and  $\mu \rightarrow e\gamma$  in  $B - L$  Model with Inverse Seesaw,” Eur. Phys. J. C **72**, 2108 (2012) [arXiv:1105.1047 [hep-ph]].

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### List of Articles in arXiv

- [1] W. Abdallah, R. Gandhi and S. Roy, “LSND and MiniBooNE as guideposts to understanding the muon  $g - 2$  results and the CDF II  $W$  mass measurement,” [arXiv:2208.02264 [hep-ph]].
- [2] W. Abdallah, A. K. Barik, S. K. Rai and T. Samui, “An emergent  $Z'$  from the Higgs shadow,” [arXiv:2109.07980 [hep-ph]].

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### Collaboration and Proceeding Articles

- [1] W. Abdallah *et al.* [LHC Reinterpretation Forum], “Reinterpretation of LHC Results for New Physics: Status and Recommendations after Run 2,” SciPost Phys. **9**, 022 (2020) [arXiv:2003.07868 [hep-ph]].
- [2] W. Abdallah, R. Gandhi and S. Roy, “A simple solution to the LSND, MiniBooNE and muon  $g - 2$  anomalies,” PoS **EPS-HEP2021**, 193 (2022) doi:10.22323/1.398.0193.
- [3] W. Abdallah, S. Choubey and S. Khan, “Two component FIMP DM in a  $U(1)_{B-L}$  extension of the SM,” NDM-2020, Andromeda Conference Proceedings (2019) [arXiv:2004.13211 [hep-ph]].
- [4] J. Elam *et al.* [REDTOP Collaboration], “The REDTOP experiment: Rare  $\eta/\eta'$  Decays To Probe New Physics,” [arXiv:2203.07651 [hep-ex]].
- [5] M. A. Acero *et al.* “White Paper on Light Sterile Neutrino Searches and Related Phenomenology,” [arXiv:2203.07323 [hep-ex]].

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## Referee to journals

Results in Physics

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## Organisation of International Conferences

December 17–21, 2017 Dr. Abdallah was one of the organizing committee of Beyond the Standard Model: From Theory To Experiment International Conference (BSM-2017), Hurghada, Egypt.

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## Conferences, Schools and Workshops Attended

July 6–13, 2022 The 41st International Conference on High Energy Physics (ICHEP 2022), Bologna, Italy.

May 30–June 4, 2022 The XXX International Conference on Neutrino Physics and Astrophysics (Neutrino 2022 Online Conference), Seoul, Korea.

August 23–28, 2021 The XXVIII International Conference on Supersymmetry and Unification of Fundamental Interactions (SUSY 2021), Shanghai, China.

July 26–30, 2021 The European Physical Society Conference on High Energy Physics (EPS-HEP) Conference 2021 (Online), DESY, Germany.

July 12–14, 2021 Online Meeting of the Division of Particles and Fields of the American Physical Society (DPF21), the Florida State University, US.

November 16–20, 2020 Searching for long-lived particles at the LHC and beyond: Eighth workshop of the LHC LLP Community (Virtually, worldwide)

October 19–23, 2020 4th Inter-experiment Machine Learning Workshop (online), CERN, Geneva, Switzerland.

September 11–13, 2020 International Conference: Anomalies 2020 (online), IIT Hyderabad, India.

July 28–Aug. 6, 2020 The 40th International Conference on High Energy Physics (ICHEP 2020 Virtual Conference), Prague, Czech Republic.

June 22–July 2, 2020 The XXIX International Conference on Neutrino Physics and Astrophysics (Neutrino 2020 Online Conference), Chicago, USA.

January 11–14, 2020 International Conference on Neutrinos and Dark Matter (NDM-2020), Hurghada, Egypt.

November 18–22, 2019 Madgraph School 2019, The Institute of Mathematical Sciences (IMSc), Chennai, India.

March 04–15, 2019 RECAPP activity week, Harish-Chandra Research Institute (HRI), Allahabad, India.

February 21–28, 2019 Neutrino and dark matter activity week, Harish-Chandra Research Institute (HRI), Allahabad, India.

January 17–22, 2019 International meeting on high energy physics, Institute of Physics (IOP), Bhubaneswar, India.

July 16–19, 2018 RECAPP activity week, Harish-Chandra Research Institute (HRI), Allahabad, India.

December 17–21, 2017 Beyond the Standard Model: From Theory To Experiment Conference (BSM-2017), Hurghada, Egypt.

- October 17–21, 2016 Gravitational Waves and Cosmology & 3<sup>rd</sup> eLISA Cosmology Working Group Workshop, DESY, Hamburg, Germany.
- September 05–16, 2016 Invisibles16 School and Workshop, SISSA in Trieste and Orto Botanico in Padova, Italy.
- June 06–17, 2016 Summer School on Cosmology, ICTP, Trieste, Italy.
- December 14–17, 2015 Dark Matter - Cairo Workshop, Mena House Hotel, Giza, Egypt.
- December 03–07, 2015 Scalars 2015 Conference, Warsaw, Poland.
- July 08–18, 2014 Invisibles School and Workshop 2014, Château de Button in Gif-Sur-Yvette and Institut des Cordeliers in Paris, France.
- August 26–31, 2013 21<sup>st</sup> International Conference on Supersymmetry and Unification of Fundamental Interactions, ICTP, Trieste, Italy.
- August 20–23, 2013 School on Supersymmetry and Unification of Fundamental Interactions, ICTP, Trieste, Italy.
- June 24–28, 2013 Higgs and Beyond the Standard Model Physics at the LHC, ICTP, Trieste, Italy.
- June 10–21, 2013 Summer School on Particle Physics, ICTP, Trieste, Italy.
- February 24–28, 2013 German - Egyptian School of Particle Physics, Zewail City of Science and Technology, Giza, Egypt.
- September 17–21, 2012 International Workshop on Models of Neutrino Mass, ICTP, Trieste, Italy.
- January 25–27, 2012 Workshop on Strongly Coupled Physics Beyond the Standard Model, ICTP, Trieste, Italy.
- January 16–24, 2012 School on Strongly Coupled Physics Beyond the Standard Model, ICTP, Trieste, Italy.
- September 19–23, 2011 Beyond the Standard Model: Results with the 7 TeV LHC Collision Data, ICTP, Trieste, Italy.
- June 20–24, 2011 Workshop on Cosmic Rays and Cosmic Neutrinos: Looking at the Neutrino Sky, ICTP, Trieste, Italy.
- June 06–17, 2011 Beyond the Standard Model: Results with the 7 TeV LHC Collision Data, ICTP, Trieste, Italy.
- June 01–05, 2008 4<sup>th</sup> International Workshop on the Dark Side of the Universe (DSU 2008), the Centre for Theoretical Physics, the British University in Egypt.

### Talks Given in Conferences and Workshops

- August 2021 Light singlino DM of the natural NMSSM, The XXVIII International Conference on Supersymmetry and Unification of Fundamental Interactions (SUSY 2021), Shanghai, China.
- July 2021 A simple solution to the LSND, MiniBooNE and muon  $g - 2$  anomalies, Online Meeting of the Division of Particles and Fields of the American Physical Society (DPF21), the Florida State University, US.

- January 2020 Two component FIMP DM in a  $U(1)_{B-L}$  extension of the SM, International Conference on Neutrinos and Dark Matter (NDM-2020), Hurghada, Egypt.
- January 2020 Closing in on the Wino LSP via trilepton searches at the LHC, ENHEP Meeting, Academy of Scientific Research and Technology (ASRT), Egypt.
- February 2019 Searching for a light wino-like dark matter in the MSSM at the LHC, Neutrino and dark matter activity week, Harish-Chandra Research Institute (HRI), Allahabad, India.
- January 2019 Dark matter in SUSY  $B - L$  model with inverse seesaw mechanism, International meeting on high energy physics, dark matter working group, Institute of Physics (IOP), Bhubaneswar, India.
- September 2016 MSSM Dark Matter in Light of Higgs and LUX Results, Invisibles16 Workshop, Orto Botanico, Padova, Italy.
- December 2015 SUSY Dark Matter in Light of LHC and LUX Results, Dark Matter - Cairo Workshop, Mena House Hotel, Giza, Egypt.
- November 2015  $Z'$ -induced Invisible Right-handed Sneutrino Decays at the LHC, the 5<sup>th</sup> Egyptian School on High Energy Physics, Zewail City of Science and Technology, Giza, Egypt.
- March 2015 Leptons and the Weak Interaction, First CFP Zewail City Mini-school on Experimental Tools in Particle Physics, Zewail City of Science and Technology, Giza, Egypt.

## Poster Presentation

- July 26–30, 2021 A simple solution to the LSND, MiniBooNE and muon  $g - 2$  anomalies, EPS-HEP Conference 2021 (Online), DESY, Germany.
- September 05–16, 2016 MSSM Dark Matter in Light of Higgs and LUX Results, Invisibles16 School and Workshop, SISSA in Trieste and Orto Botanico in Padova, Italy.

## References

**Prof. Stefano Moretti**, *School of Physics and Astronomy, University of Southampton, Highfield, Southampton, United Kingdom.*

Email: s.moretti@soton.ac.uk

**Prof. Raj Gandhi**, *Harish-Chandra Research Institute, Chhatnag Road, Jhansi, Allahabad, India.*

Email: raj@hri.res.in

**Prof. Aresh Krishna Datta**, *Harish-Chandra Research Institute, Chhatnag Road, Jhansi, Allahabad, India.*

Email: asesh@hri.res.in

**Prof. Sandhya Choubey**, *Department of Physics, School of Engineering Sciences, KTH Royal Institute of Technology, AlbaNova University Center, Roslagstullsbacken, Stockholm, Sweden.*

Email: choubey@kth.se

**Prof. Shaaban Khalil**, *Center for Fundamental Physics, Zewail City of Science and Technology, Giza, Egypt.*

Email: skhalil@zewailcity.edu.eg