Curriculum Vitae

I Personal Information

Name
Dr Muhammad Hannan Younis

Terminal Qualification
PhD Physics from Politecnico Di Torino Italy (2013)

Areas of Specialization
Radiation, Medical , Nuclear & High Energy Physics.

Areas of Interest

1. Medical Physics
2. Particle Physics
3. Radioactivity Measurements
4. Design of nuclear targets for Nuclear detectors

Date of birth
22 August 1980

Designation
Tenured Associate Professor

Currently Employed at
Department of Physics,
COMSATS University
Islamabad, Pakistan
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II Academic Background

Academic Background

Degree	Year	Field/ Subject	Institution
PhD	**2013**	**Nuclear Physics**	**Politecnico Di Torino Italy**
M.Phil.	**2008**	**Radiation Physics**	**COMSATS Univeristy Islamabad**
M.Sc.	**2003**	**Physics**	**Government College University Lahore**
B.Sc.	**2000**	**Math-Statis-Physics**	**Punjab University Lahore**
F.Sc.	**1997**	**Pre-Medical**	**BISE Gujranwala**
SSC	**1995**	**Science**	**BISE Gujranwala**

III Professional Experience

I am working as Tenured Associate Professor in Department of Physics COMSATS University Islamabad since August 2013. I am incharge of Radiation Physics Lab (RPL) in Department of Physics since October 2019. Here we perform different type of experiments to know the gamma activity and radon concentrations in naturally occurring radionuclide (NORMs). During my Ph.D. time I worked in GSI laboratory Darmstadt Germany designed for the measurement of ion fragmentation cross-sections at different angles and energies between 100 and 1000 MeV/nucleon. In Politecnico Italy I mainly involved in the development and testing of Nuclear targest for the PANDA experiments. Perticularly we worked on diamond targets for testing its mechanical properties. Currently, a number of students are doing MS and BS under my supervision along with a Postdoc candidate (TWAS awardee). In my professional carrier I contributed to many Scientific conference as invited speaker in various countries including China, Japan, Germany, Spain and Italy and presented my research work. Now a days we are working on Estimation of Organ Absorbed Doses in Patients from ^{99m}Tc radioisoptope in various Islamabad Hospitals Using the Data of Olinda and IDAC Softwares.

IV Research

a) RESEARCH AREA OF INTEREST

- Detector development and Radiation Detection
- To study the prototype of Nuclear targets for ion beams analysis for PANDA experiments
- Measurements of NORM (Naturally Occurring Radionuclide Measurements Using Nuclear Detectors
- Experimental study of fragments production cross section for nucleon induced reaction at intermediate energies
- Radiation Oncology study absorbed dose calculations in Medical Physics Field

b) RESEARCH EXPERIENCE

- Working as Assistant Professor in Department of Physics (Teacher, Supervisor and Researcher) Since 2013

- Worked on the simulation mounting and running of the TOF (Time of flight) Detector in GSI(Gesellschaft für Schwerionenforschung) Darmstadt Germany

- Involved in designing, producing and testing the special suitable target to be inserted inside the High energy Storage ring

- Worked as a Shift member at FIRST Control Room – FIRST experiment at GSI (Gesellschaft für Schwerionenforschung) Geramny.

- Worked at GSI as part of FIRST Collaboration during the beam times with main work on beam position detectors

- Member of PANDA (Proton anti proton Annihilation at Darmstadt) Collaboration and FAIR (Facility for Antiproton and Ion Research)

c) Active Projects

- Measuring Radon Concentration Both with Active and Passive techniques. For Active techniques we have RAD 7 and for Passive techniques we use CR-39 or CN-85 SSNTD detectors.
- Study of radioactivity of Naturally Occurring Radio nuclide Materials (NORMS) in different

biological and Geological materials are possible using mainly HPGe detector also we used NaI(Tl) detectors for gamma emission study.

- RPL also very active in Medical Physics, as most of the MS research students are in collaborations with NORI and Shifa Hospitals perform different task. Mainly involve in the measurements of internal dose using different software's like OLINDA and IDAC
- Elemental analysis of the different materials and samples are possible using PIXE or NAA techniques. These are done with the help of NCP and PINSTECH organization.
- Monitoring of aerosols and air contamination activity using Air Sampler with specialized filters are also investigated in our LAB.

c) Conference Contributions

Following are the list of places where I presented my research work as a contributory oral speaker of the scientific conferences hold in various countries.

1- Mainz, Germany:

Conference Title: Targets for Accelerator-Based Research (INTDS 2012) Held: August 19-24, 2012

Contributed Talk Title: Project of an internal target for the Antiproton Ring at FAIR

2- Barcelona, Spain:

Conference Title: Barcelona Postgrad Encounters on Fundamental Physics Held: 17th to the 19th of October 2012. Contributed Talk Title: The internal diamond target for the hyper-nuclear physics at HESR.

3- Wuhan, China:

Conference Title: 2013 Spring World Congress on Engineering and Technology (SCET2013)

Contributed Talk Title: Search for Lambda-Lambda hyper-nuclei using antiprotons in PANDA

4- Tokyo, Japan:

Conference Title: 27th International Conference of the International Nuclear Target Development Society (INTDS-2014) Contributed Talk Title: Production of a thin diamond target by LASER for HESR at FAIR. August 31 - September 5, 2014. Funding Agency HEC

https://indico2.riken.jp/indico/conferenceOtherViews.py?view=standard&confId=1161

5- NCP, Pakistan

Oral Presentation in International Scientific Spring -2015 NCP, 16-20 March in Activity of " Particle Physics and Cosmology " Title of the Talk " Project of an Internal target for the antiproton ring at FAIR". Web Link http://www.ncp.edu.pk/iss-2015.php

6- **NCP, Pakistan**

Oral Presentation in 44TH INTERNATIONAL NATHIAGALI SUMMER COLLEGE ON PHYSICS & CONTEMPORY NEEDS, 15-20 July 2019 in Activity of "High Power Laser Systems and their Applications " Title of the Talk "Production of thin diamond target by LASER for HESR at FAIR

http://www.nust.edu.pk/INSTITUTIONS/Colleges/MCS/Announcements/Pages/INSC2019.aspx

d) Research Grants/Awards

1. Research productivity award Since 2014-2019 from COMSATS University Islamabad
2. HEC Start Up Project 0.5 Million PKR from HEC
3. Travel Grant from HEC to participate Tokyo Japan Workshop

V References

1- Name: Prof. Felice Iazzi (Prof. in Nuclear Physics at Politecnico Di Torino, Italy). My PhD supervisor

Email: felice.iazzi@polito.it Mobile: +39-3355995361

2- Name: Prof. Mais Suleymanov (Director of Baku University Azerbahijan and Nuclear Researcher Dubna Russia). Head of High Energy Group Email: mais_suleymanov@comsats.edu.pk Phone:: +92-51-90495326

3- Name: Prof. Paola Gianotti (Researcher of INFN National Institute for Nuclear Physics at Frascati, Italy)

My co-supervisor Email: paola.gianotti@lnf.infn.it Phone: *(+39 -) 06 - 9403 2438*

4- Name: Prof. Dr. Maksudbek Baydjanov Associate professor and Director at Turin Polytechnic University in Tashkent

Email: maksudb77@gmail.com

5- Name: Dr. Muhammad Ajaz,
Associate Professor of Physics, Abdul Wali Khan University Mardan, Khyber Pakhtoonkhwa, Pakistan.

Email: ajaz@awkum.edu.pk CELL # +923459365656

6- Name: Dr. Bettina Lommel

Head of the Target Laboratory department at GSI Helmholtz Center for Heavy Ion Research. GSi Darmstadt Laboratories Germany

Email: B.Lommel@gsi.de

e) Journal Publications

1- Authors: M.Ajaz, K.H.Khan, H.Younis and A.Zaman Paper Title "STUDY OF SOME CHARACTERISTICS OF PROTONS USING INTERACTIONS OF LIGHT NUCLEI" Publish in Modern Physics Letters A, Vol. 28, No. 37,
(Nov 13, 2013)
Impact factor: 1.4
Web Link: http://www.worldscientific.com/doi/abs/10.1142/S0217732313501757

2- Authors: H Younis, F Balestra and F Iazzi. Paper Title: "Characteristic study of the internal target for the Double Hypernuclei physics at PANDA." Published in Journal of Instrumentation, Volume 9, April 2014
Impact Factor: 1.4
Web Link: http://iopscience.iop.org/article/10.1088/1748-0221/9/04/P04012/meta

3- Authors: H Younis, F Balestra and F Iazzi. Paper Title: Project of an internal target for the antiproton ring at FAIR" published in Journal of Radioanalytical Nuclear Chemistry (2014) 299:951–954 DOI 10.1007/s10967-013-2639-z ; Impact Factor 1.0
Weblink: https://link.springer.com/article/10.1007/s10967-013-2639-z

4- R.Rescigno et al H.Younis "Performance of the reconstruction algorithms of the FIRST experiment pixel sensor vertex

Detector" Published in Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers,
Detectors and Associated Equipment, Volume 767, 11 December 2014, Pages 34-40.
Weblink. https://www.sciencedirect.com/science/article/pii/S0168900214009528
Impact Factor: 1.5

5- Authors, M.Ajaz, H.Younis,K.Hussain and Zafar Wazir Paper titled" Average characteristics of π- - mesons in He-C
and C-C interactions at high energies" Published in International Journal of Modern Physics E, Issue 03, Volume 25, March 2016.;

Impact Factor 1.03

Web Link: https://www.worldscientific.com/doi/10.1142/S0218301316500191

6- Authors: M.Ajaz, H.Younis,K.Hussain , Paper titled: "The study of light nuclei production in different interactions at
4.2 AGeV/c." Published in Canadian Journal of Physics, *Canadian Journal of Physics*, 2016, 94(7): 693-696,
10.1139/cjp-2015-0675,
Impact Factor 1.02
Web Link: http://www.nrcresearchpress.com/doi/abs/10.1139/cjp-2015-0675#.WO4b4FN95o4

7- Authors M.Toppi, H.Younis *et al.* Paper Titled "Measurement of fragmentation cross sections of ^{12}C ions on a thin
gold target with the FIRST apparatus" Published in PHYSICAL REVIEW C 93, 064601 (2016) Impact Factor: 3.2
Weblink: https://journals.aps.org/prc/pdf/10.1103/PhysRevC.93.064601

8- H.Younis et al. Title: "THERMAL NEUTRON FLUX DISTRIBUTION IN A SMALL VOLUME CYLINDRICAL WATER TANK." Published in Georgian Electronic Scientific Journals Physics, ISSN 1512-1461, 12-12-2016:
Impact Factor 0.8
Web Link: http://gesj.internet-academy.org.ge/en/list_artic_en.php?b_sec=phys&issue=2016-06

9- Authors: A.A. Qureshi, S.Manzoor and H.Younis , Paper Title: "ASSESSMENT OF RADIATION DOSE AND EXCESSIVE LIFE-TIME CANCER RISK FROM THE BUNAIR GRANITE, NORTHERN PAKISTAN"

Published in Radiation Protection Dosimetry, DOI number; https://doi.org/10.1093/rpd/ncx095,
Published Date 20-07-2017;
Impact Factor: 1.1
web link :
https://academic.oup.com/rpd/article/doi/10.1093/rpd/ncx095/3980051/ASSESSMENT- OF-RADIATION-DOSE- AND-EXCESSIVE?guestAccessKey=fe944ba7-2332-4200-a8e2-d8c4509b93cf

10. Authors: H.Younis et al"Production of a thin diamond target by LASER for nuclear reactions inside storage rings" *Journal of Radioanalytical and Nuclear Chemistry* **volume 305**, pages737–742(2015) Impact factor: 1.0
Web link: https://link.springer.com/article/10.1007/s10967-015-4111-8

11. Authors; M.Ajaz, S.Ullah and H.Younis, Paper Title: "**Comparison of hadron production models for π±, k±, protons and antiprotons production in proton–carbon interactions at 60 GeV/c**". Published in Modern Physics Letters A", Volume 33, Issue 06, 28 February 2018
Impact factor : 1.4
Web link: https://inspirehep.net/literature/1662905

12. Sohail Ahmad, Muhammad Ajaz, Hannan Younis et al., "**Measurement of Indoor Radon Concentration In**
District Mardan, Khyber Pakhtunkhwa, Pakistan", Nuclear Physics and Atomic Energy". Vol. 19 No. 2 pp 190-195 August 2018
http://jnpae.kinr.kiev.ua/19.2/html/19.2.0190.html
Impact Factor : 0.11

13. H. Younis; Qureshi, Aziz Ahmed; Manzoor, Shahid; Anees, Muhammad, "Measurement Radioactivity in the Granites
of Pakistan A Review". Journal of Health Physics: - Volume 115 - Issue 6 - p 760–768 doi: 10.1097/HP.0000000000000917, December 2018,

https://journals.lww.com/health-physics/Abstract/2018/12000/Measurement_of_Radioactivity_in_the_Granites_of.21.aspx

Impact Factor: 1.0

14. M. Ajaz, R. Khan M. Bilal Y. Ali G. Khan H. Younis K. H. Khan Z. Wazir A. Zaman and A. Khan "Models prediction of particles ratio in pp collisions at √s = 900 GeV" **Indian J. Phys. (2019) https://doi.org/10.1007/s12648-019-01504-9**

Impact Factor: 1.3

15. Y. Ali, S. Ullah, M. Ajaz, Q. Ali and H. Younis "Study of Hadrons Produced in Proton–Carbon Interactions at 120 GeV/c Using Hadron-Production Models" Phys. Atom. Nucl. 82 (2019) 291–298.

Web Link: https://link.springer.com/article/10.1134/S1063778819030037 Impact factor: 0.5

16. S. Ullah, M. Ajaz, Z. Wazir, Y. Ali, K. H. Khan & H. Younis "Hadron production model's prediction for p_T distribution of charged hadrons in pp interactions at 7 TeV. Published in Scientific Reports Nature Research

Sci.Rep. 9 (2019) no.1, 11811 DOI: 10.1038/s41598-019-48272-4. (2019).

Web Link ; https://www.nature.com/articles/s41598-019-48272-4.pdf

Impact factor: 4.2

17. R. Khan, M. Ajaz, Y. Ali, H. Younis, "Model Predictions of Charged-Particle Azimuthal Distributions and Forward-Backward Correlations in p-p Interactions at √s = 900 GeV" , Commun. Theor. Phys. 71 (2019) 1172–1178 Vol. 71, No. 10, October 1, 2019 DOI: 10.1088/0253-6102/71/10/1172

Web Link: https://iopscience.iop.org/article/10.1088/0253-6102/71/10/1172

Impact factor: 1.1

18. Authors, H.Younis et al; "Measurement of Indoor Radon Concentration in the Hunza Valley of Karakoram Ranges Northern Pakistan", publication in Iranian Journal of Science and Technology, Transactions A Science"

Published: 26 June 2020, Impact factor, 1.1

Web link

https://link.springer.com/article/10.1007/s40995-020-00904-5#:~:text=Indoor%20radon%20measurements%20were%20carried,%2C%20Murtazabad%2C%20Karimabad%20and%20Aliabad.

19. Authors, M. Ajaz, H.Younis et al "Study of p_{T}pT spectra of light particles using modified Hagedorn

function and cosmic rays Monte Carlo event generators in proton–proton collisions at \sqrt{s}s = 900 GeV

Published in The European Physical Journal Plus , 22 December 2021 Impact Factor : 4.0

Web link https://link.springer.com/article/10.1140/epjp/s13360-021-02271-5

20. Authors: M.Ajaz, Zafar Wazir & H,Younis et al. Centrality dependence of PT distributions and nuclear

modification factor of charged particles in Pb–Pb interactions at SNN=2.76 TeV, Journal Name:

Results in Physics Volume 30, November 2021, 104790, Impact factor 4.46

Web link : https://www.sciencedirect.com/science/article/pii/S2211379721008470

21. Authors; H.Younis et al: "Study of Radioactivity in Bajaur Norite Exposed in the Himalayan Tectonic Zone of
Northern Pakistan" Published in Journal of atmosphere , Published: 22 October 2021, Impact factor 2.7

https://www.mdpi.com/2073-4433/12/11/1385

22. Authors: K.Mehboob and H.Younis et al: "Radioactivity and Radiation Hazard Indices Assessment for Phosphate
Rock Samples from Al-Jalamid, Turaif, Umm Wu'al, and As-Sanam, Saudi Arabia" Published in Arabian Journal for
Science and Engineering, Published: 11 September 2020 : Impact Factor: 2.5
https://link.springer.com/article/10.1007/s13369-020-04929-1

23. Authors: K.Mehboob and H.Younis et al, "Analysis of Doppler reactivity of SMART reactor core for hybrid fuel configurations of UO_2, MOX and $(Th/U)O_2$ using OpenMC" Publish in journal Kerntechnik, Publish June 18, 2021
https://www.degruyter.com/document/doi/10.1515/kern-2020-0063/html

24. Authors : H. Younis et al, "Determination of Radioactivity Levels in the Virgin and Fertilized Soil Samples of
Rawalpindi District, Pakistan", Published in journal, Iranian Journal of Science and Technology, Transactions A: Science
Publish date: Published: 27 February 2021,
https://link.springer.com/article/10.1007/s40995-021-01064-w
25. Authors: H.Younis et al, "Study of Radioactivity in Bajaur Norite Exposed in the Himalayan Tectonic Zone of Northern Pakistan" Published in *Atmosphere* **2021**, *12*(11), 1385; **https://doi.org/10.3390/atmos12111385**

Web link : https://www.mdpi.com/2073-4433/12/11/1385

26. Yahya A. Al-Zahrani and H.Younis et al, "Analysis of SMART reactor core with uranium mononitride for prolonged fuel cycle using OpenMC" Published in journal Kerntechnik
https://www.degruyter.com/document/doi/10.1515/kern-2021-1000/html

27. M. Ajaz H.Younis et al "Study of pT spectra of light particles using modified Hagedorn function and cosmic rays Monte Carlo event generators in proton–proton collisions at $s\sqrt{} = 900$ GeV" The European Physical Journal Plus volume 137, Article number: 52 (2022)
https://link.springer.com/article/10.1140/epjp/s13360-021-02271-5

28- M.Ajaz and H.Younis et al, "Centrality dependence of PT distributions and nuclear modification factor of charged particles in Pb–Pb interactions at SNN=2.76 TeV" Published in: Results in Physics. 30 (2021) 104790
https://www.sciencedirect.com/science/article/pii/S2211379721008470

29- M.Y.A. Ismail et al H.Younis ,"Investigating structural changes and surface modification in glassy carbon induced by xenon ion implantation and heat treatment" Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms
Volume 522, 1 July 2022, Pages 38-46

https://www.sciencedirect.com/science/article/abs/pii/S0168583X22001252

30- Javaria Razzaq, Zahida Ehsan and H Younis et al, "Linear and nonlinear analysis of Ion-Temperature-Gradient (ITG) driven mode in the asymmetric pair-ion magnetoplasma" Journal of Physica Scripta, Volume 97, Number 10, (2022) Phys. Scr. 97 105601 https://iopscience.iop.org/article/10.1088/1402-4896/ac8cbd

31- H.Younis et al "Gamma radioactivity and Environmental radiation risks of Granitoids in Central and Western Gilgit-Baltistan, Himalayas, North Pakistan" Paper Published in Results in Physics Volume 37, June 2022, 105509 4.4
https://www.sciencedirect.com/science/article/pii/S2211379722002509

32- Manuscript no. NETJOURNAL-D-22-00733R2
H.Younis et al, "Radiometric examination of fertilizers and assessment of their health hazards, commonly used in Pakistan" accepted in Nuclear Engineering and Technology Journal , 23 March 2023 Volume 55, Issue 7, July 2023, Pages 2447-2453
https://www.sciencedirect.com/science/article/pii/S1738573323001298