SYED SHABHI HAIDER, Ph.D.
Collaborative Energy Complex,
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SUMMARY

Highly motivated Physicist with a solid academic background and extensive experience in scientific research. Seeking to leverage analytical skills and innovative thinking developed during scientific research to drive growth and success in the industrial and academic sectors. Dedicated to contributing to organizational development through effective project design and strategic thinking.

CURRENT POSITION

Postdoctoral Research Fellow
July 2025 - Present

Department of Mechanical Engineering, University of North Dakota, United States

Responsibilities are

- Developing solutions for stress and pressure sensing in aerodynamic structures using mechanoluminescent (ML) materials.
- Fabrication of ML material films suitable for both aerodynamic stress-sensing and ultrasonic detection-based applications.
- Designing and implementing experimental setups for evaluating the performance of ML materials and films under aerodynamic stress conditions.
- Writing and submitting competitive research proposals for national and international grants.
- Publishing research findings in high-impact, peer-reviewed SCI journals and presenting results at prestigious international conferences.
- Supervising and mentoring master's and undergraduate students in research projects.

RESEARCH/WORK EXPERIENCES

Physicist
Dec 2024 - May 2025

Institute of Physics, Polish Academy of Sciences, Warsaw, Poland

- Studied luminescent materials for mechanoluminescence applications.
- Studied the mechanoluminescence properties of GaN:Pr quantum wires.
- Prepared the research publication devoted to the mechanoluminescence study of $LiTaO_3$:Pr, AlN:Mn, oxynitrides:Eu,Mn.
- To collaborate with other IF PAN groups if required/requested.

PhD Scholar
Dec 2020 - Dec 2024

Institute of Physics, Polish Academy of Sciences, Warsaw, Poland

- Designed and calibrated advanced experimental setups applying various mechanical stimuli to study ML phenomena.
- Investigated the underlying physics of ML across a range of doped piezoelectric materials.
- Analyzed ML optical emissions and intensity profiles during mechanical deformation; compared results with computational simulations (COMSOL Multiphysics, ANSYS).
- Performed Raman, Photoluminescence, Thermoluminescence, and Optical Absorption Spectroscopy on crystals, thin films, and powders.
- Assessed the mechanical properties of organic polymers for stress transfer analysis.
- Prepared NCN research proposals (e.g., PRELUDIUM), published scientific research outcomes in high-impact SCI journals, and presented at international conferences.

Graduate Assistant
Jan 2018 - Dec 2019

Faculty of Engineering Sciences,
GIK Institute of Engineering Sciences and Technology, Pakistan

- Investigated electrical and electrochemical properties of synthesized metal oxide and sulfide materials for energy storage and conversion applications (e.g., solar cells, batteries, supercapacitors); conducted theoretical calculations to analyze charge storage mechanisms.
- Fabricated and characterized energy storage devices (batteries, supercapacitors, and supercapatteries) using CV, GCD, and EIS techniques.
- Studied the electrical and electro-optical behavior of 2D materials and graphene-based field-effect transistors (FETs).
- Instructed undergraduate physics laboratory courses:
  (a) PH-101: Mechanics (b) PH-102: Electricity and Magnetism

Intern
Dec 2016 – Oct 2017

SUPARCO HQ, Karachi, Pakistan

- BS thesis (space sciences): Study the correlation of solar flare effect (SFE) with equatorial electrojet (EEJ) current. (Hands-on experience with Matlab software for data processing).

Lecturer
Aug 2013 - Jan 2018

Success Network, Karachi, Pakistan

- Deliver lectures at F.Sc and B.Sc degree levels in Physics and Mathematics.

Intern
May 23, 2016 - April 06, 2016

PCSIR Laboratory Karachi, Pakistan

- Designed and programmed a 4×4×4 3D LED cube.
- Constructed and programmed a line-following robot.

ACADEMICS

PhD (Physics)
Dec 2020 - Feb 2025

Institute of Physics, Polish Academy of Sciences, Warsaw, Poland.
Dissertation awarded distinction (wyróżnienie) for outstanding research quality
Dissertation Title: Unveiling Mechanical Stimuli by Mechanoluminescence: From Experimental Setup Design to Material Analysis. Mechanoluminescence is a unique phenomenon observed during the application of mechanical stimuli upon luminescent materials.
Research specialization: Photoluminescence, Mechanoluminescence, Luminescence materials, Spectroscopy analysis, Designing optical measurement techniques and setups.
Major courses: Introduction to Contemporary Physics, Solid-state physics, Condensed matter theory, Superconductivity, and magnetism.

MS(Engineering Sciences)
Jan 2018 - Dec 2019

GIK Institute of Engineering Sciences and Technology, Swabi, Pakistan
MS thesis: Carbon-metal oxide nanomaterials for electrochemical and electrical solid-state devices.
CGPA 3.75 out of 4.00
Specialized courses: Photonics, Optoelectronics, 2D Materials, Solid-State Physics, Quantum Mechanics, and Experimental Techniques.

BS (Applied Physics)
Dec 2013 - Nov 2017

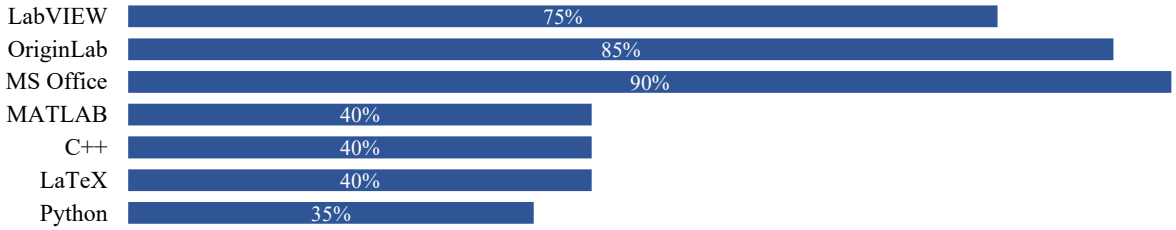
NED University of Engineering and Technology, Swabi, Pakistan
CGPA 2.85 out of 4.00
Specialization in Electronics

FSc Pre-Engineering **DJ Sindh Govt. Science College, Karachi, Pakistan**
April 2011 - April 2013 A Grade (Specialization in Engineering)

LINGUISTIC SKILLS

Urdu: Mother-tongue, English.

COMPUTER & PROGRAMMING SKILLS



ACHIEVEMENTS

- Won twice a one-month Research Grant under the STER programme by the Polish National Agency for Academic Exchange in April 2023 & March 2024.
- Won twice Eramus+ training funding, in 2023 & 2024.
- PhD position under the National Science Center, Poland, Grant No. 2019/33/B/ST8/02142 at the Institute of Physics, PAS, Warsaw, Oct 2020.
- 1st position award in Poster Competition at ICSSP'19 International Conference on Solid State Physics, Pakistan, December 08th -11th, 2019.
- Appreciation certificate for developing the program to interface the Electrical Transport Measurement Setup with LabVIEW from the Head of the Physics Department, Riphah International University - Lahore Campus, 2020.
- Won a Graduate Assistantship (GA-I) position from the GIK Institute, Pakistan, January 22, 2018.

SCIENTIFIC PUBLICATIONS

I have contributed to **27 research publications** in ISI journals, including 23 research articles, 3 review articles, and 1 book chapter. I am a leading author in 9 publications. Based on the research topic:
7 publications: luminescence and mechanoluminescence properties.
6 publications: 2D materials and field effect transistors (FETs).
14 publications: Energy storage and conversion devices like supercapacitors, supercapattery, batteries, fuel cells, solar cells, etc.
Google Scholar profile link: https://scholar.google.com/citations?user=n9ECX5gAAAAJ&hl=en.

Total Publications	Citations	*h*-Index	*I*-10	Total Impact Factor
27	1000+	13	16	100+

**according to Google Scholar.*

Publications as a leading author are below:

1. **S. S. Haider**, J. Barzowska, P. F. Smet, & A. Suchocki, Properties of ultrasound induced luminescence of $LiTaO_3$: Pr at kHz and MHz frequencies, ***Advanced Optical Materials***, e02090, 2025.
2. **S. S. Haider**, J. Barzowska, A, Suchocki. Book Chapter; Mechanoluminescence: Unveiling the Mechanical Stress, ***Specialist Periodical Reports-Nanoscience: Volume 10***, 2024.

3. **S. S. Haider**, M. Baran, R. Diduszko, et.al. Visible to Near-Infrared Mechanoluminescence from Pr-doped $LiTaO_3$ for Stress Sensing Applications, ***ACS, The Journal of Physical Chemistry C***, 489-498,128 (1), 2023. (I.F: 3.2)
4. **S. S. Haider**, J. Barzowska, P. Sybilski, A, Suchocki. Designing of experimental setup for impact induced mechanoluminescence measurements, ***Measurement***, 112012, 203, 2022. (I.F: 5.6).
5. **S. S. Haider**, S. Dad, S. Zakar, M. Z. Iqbal, Mechanistic scrutinizing the charge storage phenomena of battery-grade Mn-Co-S electrodes, ***Materials Research Bulletin***, 111953, 156, 2022. (I.F: 5.7)
6. **S. S. Haider**, S. Zakar, M. Z. Iqbal, S. Dad, Battery-type electrodeposited ternary metal sulfides electrodes for advanced hybrid energy storage devices, ***Journal of Electroanalytical Chemistry***, 115881, 904, 2022. (I.F: 4.1)
7. **S. S. Haider***, M. Z. Iqbal*, S. Zakar, et.al. Superior performance of electrodeposited CoMnS as novel electrode material for supercapattery devices, ***Journal of Energy Storage***, 102608, 39, 2021. (I.F: 9.8)
8. M. Z. Iqbal*, **S. S. Haider**, S. Zakar, et.al. Cobalt-oxide/carbon composites for asymmetric solid-state supercapacitors, ***Materials Research Bulletin***, 110974, 131, 2020. (I F: 5.7)
9. M. Z. Iqbal*, **S. S. Haider**, S. Siddique, M.R.A.Karim, S. Zakar, et.al. Capacitive and diffusion-controlled mechanism of strontium oxide based symmetric and asymmetric device, ***Journal of Energy Storage***, 101056, 27, 2020 (I.F: 9.8)

Publications as a co-author are below:

10. J. Barzowska, **S. S. Haider**, T. Zheng, A. Suchocki, P.F. Smet, M. Runowski, N.J. Cherepy, D. Peng, and S. Mahlik, "Turning sound and force into light with AlN: Mn^{2+} mechanoluminescence." *Science Advances*, 12(26), p.5469, 2026.
11. S. Zakar, M. Z. Iqbal, **S. S. Haider**, Binder-free ternary transition metal sulfides for energy storage applications, ***International Journal of Energy Research***, 15696-15708, 46, 2022. (I.F: 4.2)
12. Z. Iqbal, S. Zakar, **S. S. Haider**, et al. Electrodeposited CuMnS and CoMnS electrodes for high performance asymmetric supercapacitor devices, ***Ceramics International***, 21343, 46, 2020. (I.F. 5.6)
13. A. K. Somakumar, Y. Zhydachevskyy, D. Wlodarczyk, **S. S. Haider**, J. Barzowska,... & A. Suchocki. Temperature and pressure dependent luminescence mechanism of a zinc blende structured ZnS: Mn nanophosphor under UV excitation, ***Journal of Materials Chemistry C***, 7041-7052, 12 (19), 2024. (I.F. 5.1)
14. V. Chornii, S. Nedilko, M. Lazarenko, O. Alekseev, M. Sosnovs'ka, V. Barbash, O. Yashchenko, **S. S. Haider**, Y. Zhydachevskyy, A. Suchocki, "Fabrication and Mechanical, Dielectric and Optical Properties of Cellulose Paper Embedded with SrAl2O4:Eu,Dy Phosphor", ***Journal of Renewable Materials***, *13*(4), p.653, 2025.
15. M. Z. Iqbal*, S. Zakar, **S. S. Haider**, et.al. Scrutinizing the charge storage mechanism in SrO based composites for asymmetric supercapacitors by diffusion-controlled process, ***Applied Nanoscience***, 3999, 10, 2020. (I F: 3.17)
16. M. Z. Iqbal*, S. Zakar, **S. S. Haider**. Role of aqueous electrolytes on the performance of electrochemical energy storage device, ***Journal of Electroanalytical Chemistry***, 113793, 858, 2020 (I.F:4.1)
17. M. Z. Iqbal*, A. Khan, A. Numan, **S. S. Haider**, J. Iqbal. Ultrasonication-assisted synthesis of novel strontium based mixed phase structures for supercapattery devices, ***Ultrasonics Sonochemistry***, 104730, 59, 2019. (I.F: 9.7)
18. M. Z. Iqbal*, S.Siddique, A. Khan, **S. S. Haider**, et.al. Recent developments in graphene based novel structures for efficient and durable fuel cells, ***Materials Research Bulletin***, 110674, 121, 2019. (I F: 5.7)
19. M. Z. Iqbal, S. Khan, A. Rehman, **S. S. Haider**, M. A. Kamran, et.al. Enhancement in the mobility of solution processable polymer-based FET by incorporating graphene interlayer, ***Superlattices and Microstructures***, 106331, 137, 2019. (I.F: 3.0)

20. M. Z. Iqbal*, M. Faisal, S. R. Ali, **S. S. Haider**, et.al. Ultraviolet-light-driven current modulation of Au/WS2/Gr Schottky barrier, ***Physica E: Low-dimensional Systems and Nanostructures***, 133837, 117, 2019 (I.F: 2.9)
21. M. Z. Iqbal*, J. Nabi, S. Siddique, H.T.A.Awan, **S. S. Haider**, et.al. Role of graphene and transition metal dichalcogenides as hole transport layer and counter electrode in solar cells, ***International Journal of Energy Research***, 1464, 44, 2019 (I.F: 4.2)
22. M. Z. Iqbal*, S. Khan, M. A. Kamran, S. Siddique, M. J. Iqbal, T. Alharbi, S.Siddique, M. M. Faisal, **S. S. Haider**. Enhanced photo response and surface charge transfer mechanism of graphene-tungsten disulfide heterojunction, ***Optical Materials***, 109426, 98, 2019. (I.F: 4.2)
23. M. Alzaid, M. Z. Iqbal, **S. S. Haider**, S. Zakar, et. al. Charge carrier modulation in dual-gated graphene field effect transistor using honey as polar organic gate dielectric, **Applied Physics A**, 438, 127, 2021. (I.F: 2.8)
24. W. Shah, S. M. Faraz, S. Arshad, **S. S. Haider**, M. H. Sayyad. Co-sensitized DSSC with natural dyes extracted from beetroot, pomegranate and cranberry. ***Engineering Proceedings***, *32*(1), 13, 2023.
25. A. Aslam, A. Razzaq, S. Naz, N. Amin, M. I. Arshad, M.A.U. Nabi, ..., **S. S. Haider** & A. U. Rehman, Impact of lanthanum-doping on the physical and electrical properties of cobalt ferrites. ***Journal of Superconductivity and Novel Magnetism***, 34(7), 1855-1864, 2021.
26. M.Z. Iqbal*, A Khan, **S. S. Haider**, M. W. Iqbal, et.al. Magnetic field driven mobility tweaking in graphene, ***Journal of Nanoelectronics & Optoelectronics***, 1427, 14, 2019. (I.F: 0.5)
27. M.Z. Iqbal*, A Khan, S. Khan, N. Anwar, **S. S. Haider**, et.al. Formation of pn-junction with chemical modification of graphene-hexagonal boron nitride heterostructure, ***Journal of Nanoelectronics & Optoelectronics***, 1420, 14, 2019. (I.F: 0.5)

PEER-REVIEWER EXPERIENCE

Completed 20+ peer reviews for international journals, including Chemical Engineering Journal (IF: 13.2), Journal of Energy Storage (IF: 9.8), Measurement (IF: 5.6), Materials Research Bulletin (IF: 5.7), Optics and Laser Technology (IF: 5.0), and other journals in materials science, energy storage, optical materials, and engineering.

WORKSHOP & CONFERENCES

- Oral Presentation titled "Temperature-dependent ultrasonic-induced luminescence properties of $LiTaO_3$:Pr at kHz and MHz range" at E-MRS 2024 FALL MEETING & EXHIBIT, University of Technology in Warsaw, Poland, Sept. 16-19, 2024.
- Poster presentation at the Institute reporting session for results from 2022, Institute of Physics, PAS, Warsaw, Poland, 9th February 2023.
- Poster presentation titled "Designing of Experimental Setup for Impact Induced Mechanoluminescence Measurements" in the joint conference of FM&NT - NIBS 2022, Riga, Latvia, July 3rd-6th, 2022.
- Oral presentation in 1st International Conference on Applied Physics and Engineering, Department of Physics, NED University, Pakistan, 2021.
- Participated in the International Workshop on "2D materials & Quantum Effect Devices", at Pakistan Institute of Engineering & Technology, November 12th-14th, 2018.
- Participated in the International Workshop on "International Photonics symposium'18" at GIK Institute of Engineering Sciences & Technology, Pakistan, in collaboration with SPIE-OSA, 2018.
- Participated in the Workshop on "Data Science & Machine Learning" at Habib University, Pakistan, July 10th-14th, 2017.
- Practical course on "Mechatronics: Sense and Move Things with Arduino" in collaboration with ORIC at NED University of Engineering & Technology, Pakistan, Feb 6th- March 6th, 2016.

SKILLS & EXPERTISE

- Expertise in Raman, Absorption, Photoluminescence, Thermoluminescence, and Mechanoluminescence spectroscopy measurements (using Horiba Fluorolog, Andor SR-750-D1 spectrometer, Scienta R4000 hemispherical analyzer, Linkam temperature control systems, Shamrock 500i spectrometer, Cary 5000 UVVis-NIR Spectrophotometer, etc).
- Synthesis of materials using hydrothermal, sonochemical, electrodeposition, solid-state reaction, and coprecipitation methods.
- Expertise in the preparation of polymer/phosphors-based composites.
- Familiar with Scanning Electron Microscopy, X-ray diffraction, and Electrochemical measurements.
- Fabrication and characterization of ML-based mechanosensors, Electrochemical energy storage devices and Field effect transistors (FETs).
- Worked experience in the interfacing of GPIB-controlled instruments with the help of LabVIEW software, as well as expertise in Raspberry Pi, Arduino microcontrollers and PLC-based Systems.
- Expertise in scientific content writing and conference presentations.

RESEARCH VISITS

- Twice research visit to LumiLab, Department of Solid State Sciences, Ghent University, Ghent, Belgium for work on the ultrasonic-induced luminescence measurement. (i) Aug 02-31, 2023 and (ii) May 03 - June 01, 2024. (NAWA funding)
- Twice one-week training visit to the Optical Materials Lab, Institute of Solid State Physics, Riga, Latvia, on ML measurement technique as well as theoretical modeling using COMSOL Multiphysics software.(i) Sept 10-16, 2023 and (ii) Feb 25 - March 03, 2024. (Erasmus+ funding)

RESEARCH COLLABORATIONS

- Łukasiewicz Research Network, Institute of Microelectronics and Photonics, Warsaw, Poland.
- Faculty of Mathematics, Physics and Informatics, Institute of Experimental Physics, University of Gdańsk, Gdańsk, Poland.
- LumiLab, Department of Solid State Sciences, Ghent University, Ghent, Belgium.
- Optical Materials Lab, Institute of Solid State Physics, Riga, Latvia.
- Department of Chemistry, University of Zululand, South Africa.
- Renewable Energy Research Laboratory, Faculty of Engineering Sciences, Ghulam Ishaq Khan Institute of Engineering and Technology, Topi, Khyber Pakhtunkhwa 23640, Pakistan

REFERENCES

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Email: carson.running@UND.edu

Declaration:
I hereby declare that all the particulars given by me on this curriculum vitae are, to the best of my knowledge and belief, true and correct.



Date: 09/17/2026
Place: Grand Forks, United States

Syed Shabhi Haider