

## Curriculum Vitae

### 4.1 General Overview

<i>First and last names:</i>	Aamir Mushtaq
<i>Date and location of birth:</i>	12/06/1988 and District Rajouri, Jammu and Kashmir, India
<i>Nationality:</i>	INDIAN
<i>Title:</i>	Ph.D. in Physics (IIT Mandi and 05.02.2021)
<i>H-index:</i>	12 [Papers = 16, Patent =NIL, Citations (Google Scholar) = 509]
<i>Languages:</i>	English, Hindi, Kashmiri.
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<i>Present address</i>	Department of Physics, University of Central Florida, Orlando, FL, USA, ZIP - 32816.

### ❖ SUMMARY OF PROFESSIONAL EXPERIENCES SUMMARY

<i>Current Position</i>	Research Associate in the Department of Physics, The University of Central Florida, Orlando, FL, USA, ZIP - 32826. Working in Solid State High-Order Harmonic Generation in Exotic 2D Materials.
<i>13Feb. 2022- 13 Feb. 2023</i>	Postdoctoral Fellow in the Department of Material Science and Engineering, The Ohio State University, Ohio, Columbus, USA, ZIP-43202. Worked in Ultra-Intense Light Matter Interaction and Nonlinear Optics in Exotic 2D Materials.
<i>1 Oct. 2021- 13 Feb. 2023</i>	Postdoctoral fellow in the Department of Mechanical and Aerospace Engineering, Missouri University of Science and Technology, Missouri, Rolla, USA, ZIP-65401. Worked in the Area of Nonlinear Optics of 2D Materials and Photoluminescence Up-conversion
<i>July 2015 – February 2021</i>	Ph.D. Student, School of Basic Sciences (Physics), IIT Mandi, India.

### ❖ SUMMARY OF EDUCATION

#### 2015-2021

<i>Degree:</i>	Ph.D. in Physics (Ultrafast Spectroscopy and Nonlinear Optics)
<i>University:</i>	Indian Institute of Technology (IIT) Mandi, Himachal Pradesh, India
<i>Thesis Title:</i>	Third Order Optical Nonlinearity and Ultrafast Carrier Dynamics in Two Dimensional Materials and their Heterostructures in Femtosecond Regime.
<i>Supervisor:</i>	Prof. Dr. Suman Kalyan Pal

#### 2010–2012

<i>Degree:</i>	Master's in Science (M.Sc.) in Physics (Percentage 68.13)
<i>University:</i>	Jamia Millia Islamia, New Delhi, India
<i>Thesis Title:</i>	“Optical Gain of Phenoxazone 660 dye” (A Study Based on Effect of Concentration and Laser Intensity on Optical Gain of Phenoxazone 660 Dye).
<i>Supervisor:</i>	Dr. Shahid Khan

#### 2012–2014

<i>Degree:</i>	Master's in Technology (M.Tech) in Nanotechnology (Graduated, First with Honour, 8.19 CGPA)
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*University:* Jamia Millia Islamia, New Delhi, India

*Thesis Title:* Functionalization of Carbon Nanotubes with Dye and Study of their Nonlinear Optical Properties.

2005–2009

*Degree:* Bachelor's in science (B.Sc) (Graduated with 1st division, Percentage 67.75)

*University:* Jammu University, Jammu and Kashmir, India

*Effect of pandemic on my academics:* Covid19 has created a mayhem in the scientific community. From April 2020 to August 2020 complete closure of my institute and laboratories resulted in delaying of certain experiments which ultimately resulted in the delayed submission of my Ph.D. thesis. Apart from that from March 2021 to September 2021 because of pandemic my posdoc joining was also delayed for few months.

#### ❖ SUMMARY OF PRESENTATIONS IN CONFERENCE

- Attended conference on Spectroscopy of Emerging Functional Materials (SEFM-2017) IIT Mandi (H.P).
- 14th DAE-BRNS Biennial Trombay Symposium on Radiation & Photochemistry (TSRP-2018), BARC Mumbai.
- Attended Conference on Ultrafast Spectroscopy UFS -2018 at RRCAT Indore.
- National Conference Discussion Meeting on Recent Advances in Magnetism Held at IIT Mandi (H.P.).
- 13th National Symposium on Radiation & Photochemistry (NSRP-2019), Visva-Bharati University Kolkata.
- 2nd International Conference on Advanced Materials SCICON (2019), Amrita Vishwa Vidyapeetham Coimbatore, Tamil Nadu.
- International Conference On Atomic, Molecular, Optical And Nanophysics With Application CAMNP (2019) Delhi Technological University (DTU) Delhi.
- Presented Poster at International Conference (Graphene 2020) Held at France (virtual mode).
- Presented Poster at Student Conference on Photonics and Quantum Technology (SCPQT) 2021.
- Presented Poster at International Conference IEEE Photonic 2023 Orlando, FL, USA.
- Presented Poster at International Conference LASERNET 2024 at Austin, USA
- Presented Poster at International Conference FIO+LS 2024 at Denver, USA

#### ❖ SUMMARY OF TEACHING, LEARNING, WRITING AND EVALUATION SKILLS

- 5 years teaching assistantship at IIT Mandi as a teaching assistant (during Ph.D.) in a course of Laser, Quantum Mechanics, Electromagnetic Theory, Nuclear and Particle Physics and M.sc Physics Lab.

#### ❖ SUMMARY OF AWARDS AND HONORS

- Best Teaching Assistant Award 2017 at IIT Mandi.
- Best Poster Award at International Conference on Atomic, Molecular, Optical and Nanophysics with Application CAMNP (2019) Delhi Technological University (DTU) Delhi, India.
- Best Poster Award at International Conference on Smart Materials for Sustainable Technology (SMST 2020) IIT Goa, India.
- Seal of Excellence for Outstanding Marie Curie Proposal 2022 (fellowship not granted due to limited funds)
- Awarded Prestigious **Ramanujan Fellowship (2025)** by Govt. of India, meant for brilliant Indian/Indian Origin scientists and engineers from outside India.

#### ❖ Invited talk

- Presented an Invited Talk at USA Air Force Research Laboratory (AFRL), RXAP Branch Seminar on “Third Order Optical Nonlinearity and Ultrafast Carrier Dynamics in 2D/0D Materials and their Heterostructures in the Femtosecond Regime” on 22/7/2022 at Dayton, Ohio, USA

#### ❖ Reviewer

- I. **Nature Communication**
- II. **Optical Society of America, OSA** (*Optics express, JOSA B, Optics Letter, Applied Optics*)
- III. **American Institute of Physics, AIP** (*Journal of Applied Physics (JAP)*)
- IV. **Journal of Optics and Photonics Research (JOPR)**

## 4.2 Research Experience Description

### ❖ EXPERIENCE IN HANDLING THE FOLLOWING TOOLS:

- Time Correlated Single Photon Counting (TCSPC).
- Pump-Probe with Femtosecond Laser/ Transient Absorption (TA).
- Z-scan with Femtosecond Laser.
- Temperature Dependent PL Study.
- Transmission Electron Microscopy (TEM): (result analysis).
- Atomic Force Microscopy (AFM): (result analysis).
- Scanning Electron Microscopy (SEM): (result analysis).
- Confocal Microscopy (elementary).
- X-ray Diffraction (XRD) (result analysis).
- X-ray Photoelectron Spectroscopy (XPS): result analysis (elementary idea).
- Third harmonic Generation
- Working Experience with Home-Built Laser System
- Currently Involved in **High-Order Harmonic Generation (HHG)** in 2D Materials.

### ❖ EXPERIENCE IN SETTING-UP DIFFERENT EXPERIMENTS AND SYNTHESIS OF MATERIALS:

#### ❖ SET UP BUILD

- Z-scan Setup.
- UV-Visible Absorption and PL Setup.
- Solid State HHG Setup

#### ❖ SYNTHESIS

- MoS<sub>2</sub>, ReS<sub>2</sub> and SnS via Liquid Phase Exfoliation Technique.
- ZnO Nanoparticles via Chemical Route.

#### ❖ BASIC COMPUTER SKILLS

- **Software:** Origin, Adobe Photoshop, Elementary Idea of MATLAB.

## 4.3 Publications

### ❖ PUBLICATIONS

16 publications (first author in 8, citations 548, h index 12)

*In this section, IF = Impact Factor, GSC = Google Scholar Citations, as reported on August 10<sup>th</sup>, 2025*

#### Author Contributions:

1. **Mushtaq, A.**; Journigan, T; Turkowski, V; Siebenaller, R; Jeff, D; Truong, T; Noor, M; Khatri, D; Lantigua, C; Harrison, K; Khondaker, S; Rowe, E; Goldstein, J; Susner, A.M; Chowdhury, E; and Chini, M. Efficient High-Order Harmonic Generation from van der Waals Layered Crystal Copper Indium Thiophosphate. *JACS*, **2024**, 146,35, 24288-24295. **IF = 15.5**
2. **Mushtaq, A.**; Journigan, T; Turkowski, V; Siebenaller, R; Jeff, D; Noor, M; Khondaker, S; Rowe, E; Goldstein, J; Susner, A.M; Chowdhury, E; and Chini, M. Strain Induced High-Order Harmonic Generation in Metal Thiophosphate. (*under preparation for PRL*)
3. Tiwari, A.; Debnath, A.; Moinuddin, M.G; **Mushtaq, A.**; Singh, A.; Sharma, S.K.; Randhawa, J.K. Multifunctional fluorescent SPIONs display exceptional optical/magnetic contrast and enhanced photoconductivity in interdigitated electrode based photoresponsive devices. *J. Mater. Chem. A*, **2024**, 12, 3096-3110. **IF = 12**
4. Kushavah, D.; **Mushtaq, A.**; Pal, S. K. Ultrafast and nonlinear optical properties of two-dimensional Mo-doped dual phase inorganic lead halide perovskite. *J. Phys. Chem. C*. **2023**, 127,40, 20014-20025. **IF = 4.17**
5. **Mushtaq, A.**; \*, Yaseen, M.; Kuz, C.; DeAngelis, E.; Siebenaller, R.; Fisher, A.; Twardowski, J; Salman, G.K; Myers, C.R.; Conner, B.; Susner, A.M; Chowdhury, E., AgScP<sub>2</sub>S<sub>6</sub> van der Waals Layered Crystal: A Material with a Unique Combination of Extreme Nonlinear Optical Properties. *J. Phys. Chem. Lett.* **2023**, 14, 3527-3534.

**IF = 6.8**

6. **Mushtaq, A.;** Gao, J.; Yang, X., Unveiling Room Temperature Up-Conversion Photoluminescence Phenomenon in Monolayer WSe<sub>2</sub>. *Opt. Express*. **2022**, 30 (25), 45212-45220. **IF = 3.8**
7. **Mushtaq, A.;** Pradhan, B.; Kushavah, D.; Zhang, Y.; Naumenko, D.; Amenitsch, H.; Hofkens, J.; Pal, S.K., Deciphering Femtosecond Third-Order Nonlinear Optical Properties of Quasi 2D Ruddlesden-Popper Perovskite Film. *Mater. Adv.* **2022**, 3 (22), 8211-8219.
8. **Mushtaq, A.;** \*, Clink, L.; Yaseen, M.; Kuz, C.; DeAngelis, E.; Siebenaller, R.; Fisher, A.; Verma, D.; Myers, C.R.; Conner, B.; Susner, A.M.; Chowdhury, E., Ultrafast Nonlinear Absorption and Second Harmonic Generation in Cu<sub>0.33</sub>In<sub>1.30</sub>P<sub>2</sub>S<sub>6</sub> Van der Waals Layered Crystals. *J. Phys. Chem. Lett.* **2022**, 13 (45), 10513-10521. **IF = 6.8**
9. **Mushtaq, A.;** Pradhan, B.; Kushavah, D.; Zhang, Y.; Wolf, M.; Schrenker, N.; Fron, E.; Bals, S.; Hofkens, J.; Debroye, E.; Pal, S.K., Third Order Nonlinear Optical Properties and Saturation of Two-Photon Absorption in Lead Free Double Perovskite Nanocrystals (NCs) Under Femtosecond Excitations. *ACS Photonics* **2021**, 8 (11), 3365-3374. **IF = 7.5**
10. Wadhwa, R; Agrawal, A.V; Kushavah, D; **Mushtaq, A.;** Pal, S.K; Kumar, M., Investigation of charge transport and band alignment of MoS<sub>2</sub>-ReS<sub>2</sub> heterointerface for high performance and self-driven broadband photodetection. *Appl. Surf. Sci.* 2021, 569, 150949. **IF = 7.3**
11. Kushavah, D.; **Mushtaq, A.;** Ghosh, S.; Pal, S. K., Optical Properties of Two-Dimensional CdSe Synthesized from MoS<sub>2</sub> Sheets as Template. *Physica E*. **2021**, 130, 114682. **IF: 3.5**
12. Sarkar, A. S.; **Mushtaq, A.;** Kushavah, D.; Pal, S. K., Liquid Exfoliation of Electronic Grade Ultrathin Tin(II) Sulfide (SnS) with Intriguing Optical Response. *NPJ 2D Mater. Appl.* **2020**, 4 (1), 1-9. **IF: 11.1**
13. Ghosh, S.; Shi, Q.;# Pradhan, B.;# **Mushtaq, A.;**# Acharya, S.; Karki, K. J.; Pullerits, T.; Pal, S. K., Light- Induced Defect Healing and Strong Many-Body Interactions in Formamidinium Lead Bromide Perovskite Nanocrystals. *J. Phys. Chem. Lett.* **2020**, 11 (4), 1239-1246. **IF: 6.7**
14. Kumar, A.; Vempuluru, N.R.; Kumar, A.; **Mushtaq, A.;** Sharma, L.; Halder, A.; Pal, S.K.; Muthukonda, V.S.; Krishnan, V., Three-Dimensional Carbonaceous Aerogels Embedded with Rh-SrTiO<sub>3</sub> for Enhanced Hydrogen Evolution Triggered by Multiple Reflections of Incident Visible Light. *ACS Appl. Energy. Mater.* **2020**, 3, (12), 12134–12147. **IF: 5.7**
15. **Mushtaq, A.;** Kushavah, D.; Ghosh, S.; Pal, S. K., Nonlinear Optical Properties of Benzylamine Lead (II) Bromide Perovskite Microdisks in Femtosecond Regime. *Appl. Phys. Lett.* **2019**, 114 (5), 051902. **IF: 3.8**
16. Pradhan, B.; **Mushtaq, A.;** Roy, D.; Sain, S.; Das, B.; Ghorai, U. K.; Pal, S. K.; Acharya, S., Postsynthesis Spontaneous Coalescence of Mixed-Halide Perovskite Nanocubes into Phase-Stable Single-Crystalline Uniform Luminescent Nanowires. *J. Phys. Chem. Lett.* **2019**, 10 (8), 1805-1812. **IF: 6.7**
17. **Mushtaq, A.;** Ghosh, S.; Sarkar, A. S.; Pal, S. K., Multiple Exciton Harvesting at Zero-Dimensional/Two Dimensional Heterostructures. *ACS Energy Lett.* **2017**, 2 (8), 1879-1885. **IF: 23.1**

# Represents authors contributed equally

#### 4.4 Extracurricular Activities

- Macro photographer
- Cyclist

#### 4.5 References

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