

ANJALI VERMA

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PROFESSIONAL SUMMARY

Ambitious and highly skilled Ph.D. candidate in Materials Chemistry with a 4.0 GPA and over five years of experience developing and optimizing materials for real-world applications. Experienced in designing and tailoring solid-state materials—including pigments, semiconductors, dielectrics, and thermoelectrics—as well as fluorophores and quantum dots, with a strong focus on structure–property relationships and sustainable innovation for energy-saving coatings, electronic devices, and optoelectronic applications. Proficient in planning and conducting both computational and experimental studies using Design of Experiments (DOE) frameworks, leading to 10 successful R&D projects. Adept at applying complex data analysis and process optimization to fine-tune material properties and improve production efficiency. Demonstrated leadership as a Laboratory Safety Manager, enhancing operational protocols and cultivating a safety-first culture. Proven success in mentoring teams, driving cross-functional collaboration, and leading continuous improvement initiatives. Excellent communicator with a strong publication record and experience delivering impactful presentations to technical and academic audiences.

WORK EXPERIENCE

• Graduate Researcher

Oregon State University

Corvallis, OR

09/2021 - 05/2025

- **Led 10 successful R&D projects** on the **synthesis and characterization of novel solid-state materials**, including **pigments, semiconductors, dielectrics, and thermoelectrics**, demonstrating expertise in **material development, data analysis, and process optimization**.
- **Designed and led several R&D projects** focused on **developing non-toxic, durable pigments** by leveraging an in-depth understanding of **light and material interactions** and **advanced optical characterization techniques**.
- **Applied** in-depth knowledge of **semiconductors** and **structure–property relationships** to rationally design a project on **transition metal oxide-based semiconductor materials**, resulting in a **publication in progress**.
- Completed **coursework on advanced characterization techniques** and **thin-film coatings**, enhancing expertise in **material property evaluation** and **surface modification** using **deposition techniques** such as PVD and CVD. Gained foundational knowledge of **semiconductor fabrication processes**, including wafer preparation, photolithography and etching.
- **Successfully solved** over **15 crystal structures** of solid solutions using XRD, synchrotron, and neutron diffraction data to **determine atomic occupancies** and effectively **correlate** them with **material properties**.
- Utilized **other advanced characterization techniques**—including four-probe electronic measurements, optical spectroscopy, microscopy, Mössbauer spectroscopy, TGA, and LCR meter—to **assess and benchmark material properties**.
- **Authored 5 high-impact publications** (including 2 as first author), with **4+ additional publications underway** (3 as first author). **Contributed** to advancements in **tailoring materials** with precise optical, electronic, and magnetic properties through **exceptional data analysis skills**.
- **Collaborated** with **supervisors and colleagues** to implement new technologies, conduct laboratory experiments, and monitor process control while applying advanced optimization techniques to support product development and scale-up of novel materials for **enhanced efficiency and performance**.
- **Mentored 7 students** (5 undergraduates and 2 master's) in **experimental design** and **material development**, enhancing their **technical skills** and contributing to **collaborative publications**.
- **Improved lab productivity and system efficiency** by initiating **testing and training protocols** for over **5 laboratory instruments**, which **streamlined operations** and **reduced equipment downtime**.
- Appointed as **Laboratory Safety Manager** based on a strong safety-first culture, developed and implemented **4+ regulatory safety protocols**, eliminating safety incidents per EHS guidelines.

• Undergraduate and Master Researcher

Indian Institute of Science Education and Research Kolkata

Kolkata, India

08/2016 - 08/2021

- Completed **basic** and **advanced courses** on **physical techniques for structural elucidation**, enhancing expertise in the application of various methods to determine the chemical composition and structure.
- Completed a **summer internship** on the **synthesis of fused bithiophene-based conjugated systems**, exploring materials for **optoelectronic devices** including **OFETs**, **OLEDs**, and **OPVs**.
- Synthesized **fluorescent chromophores** and **quantum dots** during **Master's research** for applications in bioimaging and optoelectronics, employing **experimental** and **computational techniques** such as **Density Functional Theory (DFT)**, **Fluorescence Spectroscopy**, and **Electron Optics (Transmission Electron Microscopy)**.

EDUCATION

- Doctor of Philosophy in Materials Chemistry**

Oregon State University

Corvallis, OR

09/2021 - 05/2025

- Cumulative **GPA**: 4.00/4.00
- Awarded **Milton Harris Fellowship (2023)** and **Scholarly Presentation Award (2024)** for excellence in research

- Bachelor and Master of Science in Chemistry**

Indian Institute of Science Education and Research Kolkata

Kolkata, India

08/2016 - 08/2021

- Cumulative **GPA**: 8.85/10.00
- Awarded **certifications** for **teaching** courses on **Fluorescence Spectroscopy: Principles and Applications**, **Quantum Chemistry**, **Fundamental of Spectroscopy**, and **General Physical Chemistry (2020–2021)**

SKILLS

- Technical Skills:**

- Data Analysis and Computational:** GSAS/EXPGUI, GSAS-II, VESTA, Microsoft Office, Origin, Python, MATLAB
- Experimental:** Organic Synthesis, Solid-State Synthesis, X-ray Diffractometer (XRD), UV-Vis-NIR Spectrophotometer, Colorimeter, Seebeck Coefficient/Electric Resistance Measurement System (ZEM), Thermogravimetric Analyzer (TGA), LCR Meter, Magnetic Property Measurement System (MPMS), X-ray Photoelectron Spectrometer (XPS), Fluorescence Spectrometer, Fourier Transform Infrared (FTIR) Spectrometer, Nuclear Magnetic Resonance (NMR) Spectrometer, Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM)
- Additional Techniques (Familiarity):** Lithography, Etching, Chemical Vapor Deposition (CVD), Physical Vapor Deposition (PVD)
- Analytical:** Design of Experiments (DOE), Root Cause Analysis, Process Optimization, Continuous Improvement Strategies, Advanced Statistical Analysis, Data Visualization, Structure Refinements

- Soft Skills:** Leadership, Adaptability, Effective Communication, Project and Team Management, Mentoring, Problem-Solving

PUBLICATIONS

- Verma, A.**; Li, J.; Subramanian, M. A. Cr^{2+} in Square Planar Coordination: Durable and Intense Magenta Pigments Inspired by Lunar Mineralogy. *Chem. Mater.* **2024**, 36 (8), 3837–3843.
- Verma, A.**; Li, J.; Ramirez, A. P.; Subramanian, M. A. Understanding Color Variation with Site Distribution in Inverse Spinel Structure via Neutron Diffraction, Magnetism, and Optical Studies. *Progress in Solid State Chemistry* **2024**, 100455.
- Verma, A.**; Li, J.; Subramanian, M. A. Magnetic and Electronic Properties of New Precious Metal Based Normal Spinel's: $\text{LiRhRu}_{1-x}\text{Ir}_x\text{O}_4$, $\text{LiFeIr}_{1-x}\text{Ru}_x\text{O}_4$, and $\text{LiCoIr}_{1-x}\text{Ru}_x\text{O}_4$. (*In progress*).

ACHIEVEMENTS

- My recent publication** " Cr^{2+} in Square Planar Coordination: Durable and Intense Magenta Pigments Inspired by Lunar Mineralogy" **garnered coverage** in **numerous magazines** highlighting its significant impact in advancing materials chemistry.
- Featured in the magazine** "At the End of the Rainbow: The Neverending Frontier of Color" by **Beaver's Digest**, reflecting my passion for scientific inquiry.
- Qualified for several of India's toughest competitive exams** (IIT-JEE MAINS (2016), IIT-JEE ADVANCED (2016), NET (2021), and GATE (2021)), reflecting a commitment to continuous learning and skill enhancement.