RICHA AGRAWAL

B.Tech., Materials Science and Engineering
M.Sc., Materials Science and Engineering

PROFILE

I am a materials and biomaterials scientist, with an interest in academic publishing. I am looking to use my knowledge for a career in science communication and publishing with a focus on semiconductors, energy materials, memory devices, and biomaterials.

CONTACT

PHONE:
+44 (0) 746 717 1622

EMAIL:
richaagrawal111995@gmail.com

LINKEDIN:
www.linkedin.com/in/richa-agrawal11

GITHUB:
https://agrricha.github.io/

NATIONALITY:
Indian

WORK PERMIT:
High Potential Individual (HPI) Work Visa | Validity: 31-Oct-2024

ADDRESS:
Flat 52, Graciosa Court, 176 Harford Street, London,
E14GF

EDUCATION

École Polytechnique Fédérale de Lausanne (EPFL), Switzerland

Department Rank 1 (GPA: 5.85/6)
M.Sc. Materials Science and Engineering 2019 – 2021

Indian Institute of Technology Kanpur (IIT Kanpur), India

Department Rank 1 (GPA: 9.5/10)
B.Tech. Materials Science and Engineering 2013 – 2017

WORK EXPERIENCE

Laboratory of Nanoscale Magnetic Materials and Magnonics, EPFL

Research Assistant (Supervisor: Prof. Dirk Grundler) 2021–2022

- Conducted a thorough literature review of over **75 journal articles** to optimize the bio-inspired DNA Origami technique with magnetic nanoparticles.
- Developed nanomagnets using DNA Origami technique to achieve **a low-cost sub-50 nm fabrication scale**. Characterization using electron microscopy, electrophoresis, and atomic force microscopy.
- Fabricated energy-efficient and miniaturized magnonic devices for applications in GHz to THz frequency regime using bottom-up nanotechnology. *(This is ongoing work.)*

Auctus Advisors Pvt Ltd (management consulting)

Business Analyst achieved one of the highest internal ratings of 1.5 2017–2019

- End-to-end management of investment portfolio, strategy, and operations for Canada's largest pension investment manager.
- Analyzed over **270 brownfield highways in 19 European countries** to identify suitable long-term investments with the top 10 funds and developers. **Impact –** Successful acquisition of 100% stake in two operational Portuguese roads for **$231m**.
- Developed Highway Safety Roadmap by benchmarking 8 toll roads in 4 countries against comparable assets and national standards **Impact –** Resulted in a focused **asset-wise strategic initiative** to improve road safety conditions for each road for the client

RESEARCH EXPERIENCE

Bionanophotonic Systems Laboratory (BIOS, EPFL)

Master Thesis Project (Supervisor: Prof. Hatice Altug) Feb 2021 – Jun 2021

"Label-free sensing of native biological samples with mid-IR

- Worked on label-free biosensing using mid-IR metasurfaces to identify cancerous cells using microfluidic Fourier-transform infrared (FTIR) spectroscopy.
- **Multi-disciplinary literature review** to develop process flow for cell detection and analysis on plasmonic chips.
- Achieved real-time analysis on two different types of cells – cancer cells and

SKILLS

Research, Analysis & Reporting
Literature review, Latex, MS Word, MS Powerpoint, Adobe Illustrator

Fabrication & Characterization
Cleanroom experience, Electron beam lithography, Evaporation and Sputtering, Ion Beam Etching, DNA tile technique (Annealing & Deposition), Photolithography, Scanning Electron Microscopy, Atomic Force Microscopy, Magnetic Force Microscopy, Fourier Transform Infrared Spectroscopy, Hall measurements, X-ray Diffraction, Raman Spectroscopy, Brillouin light scattering

Programming languages and applications
Mathematica, Python, ImageJ, Origin, HTML, CSS

AWARDS

Prize of the best average of Master's degree (2021) in Materials Science and Engineering, EPFL

EPFL Excellence Fellowship (2019)

General Proficiency Medal (2017) for the best academic performance in the department, IIT Kanpur

Ratan Swarup Memorial Prize 2017 for the best all-round performance, IIT Kanpur

OP Jindal Engineering and Management Scholar for 2 years (2014, 2015) for excellence in leadership and academics

IIT Kanpur Excellence in Art & Cultural Activities award 2017 for active participation in dramatics

immune cells, using ML for the relative quantification of proteins, nucleic acids, carbohydrates, and lipids of the cells.

Laboratory of Nanoscale Magnetic Materials and Magnonics (LMGN, EPFL)
Semester Project (Supervisor: Prof. Dirk Grundler) Sep 2020 – Jan 2021

- Characterized the coupling between charge transport and magnetization in the newly developed room temperature Skyrmion-hosting material – Co-Zn-Mn bulk alloy.
- Found evidence of anomalous hall effect in magneto-transport properties of this bulk alloy in varying temperatures and fields.

Laboratory of Computational Science and Modeling (COSMO, EPFL)
Semester Project (Supervisor: Prof. Michele Ceriotti) Sep 2020 – Jan 2021

- Developed **command line tools in python** for atomic system representations using the N-body iterative contraction of the equivariant (NICE) framework in atomistic machine learning.

Laboratory of Semiconductor Materials (LMSC, EPFL)
Semester Project (Supervisor: Prof. Anna Fontcuberta i Morral) Sep 2019 – Jan 2020

- Literature review to assess the suitability of Germanium Tin (GeSn) as the photodetection material for Light Detection and Ranging (LiDAR) sensors for autonomous vehicles.
- Optimized GeSn crystal quality by developing rapid thermal annealing protocol on different substrates – Si and Ge.

Center For 2-Dimensional & Layered Materials, Pennsylvania State University, USA
Summer Internship (Supervisor: Prof. Joshua Robinson) May 2016 – Jul 2016
SN Bose Scholar (Student exchange program between India and the USA)

- Literature review of chemical vapour deposition of 2D Gallium Selenide (GaSe), and crystal quality improvement.
- Optimized the growth conditions of 2D GaSe on SiO2 substrate. Synthesized and characterized 2D Gallium Selenide (GaSe) and tested the feasibility of its nitridation to Gallium Nitride (GaN).
- **Presentation Contributions**
  - "Process-Property Relationships in Two-Dimensional Gallium Selenide" at **2016 Electronic Materials Conference**, Newark, USA
  - "Realizing 2D Gallium Nitride Through Novel Atom Exchange Techniques" at **2016 Materials Research Society Fall Meeting and Exhibit**, Boston, USA

POSITIONS OF RESPONSIBILITY

Teaching Assistant, EPFL (2021 – 22) to **over 100 students** for Heat & Mass Transfer, Electromagnetism, and Introduction to Magnetic Materials and Technology.

President, YUVA-Indians, EPFL (2021 – 22), the Indian students' association. Organized networking and socializing events, career workshops, and student support during the Covid pandemic for **500+ Indian-origin students**.

Secretary, EPFelles, EPFL (2019 – 20), the female student association. Organized networking lunches and career talks to promote female role models in science.

Content Writer, Femartha, India (2017 – 18). Reviewed financial instruments like Insurance, mutual funds, and sovereign bonds among others, and **prepared easy-to-grasp infographics** to simplify financial services for women in India.

Represented India in Nepal as a part of the Indian Youth Delegation 2016, Ministry of Sports and Youth Affairs, Government of India