MAULIK KHANNA

Third Year Undergraduate
Indian Institute of Technology Kanpur
Materials Science and Engineering

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EDUCATION

Year	Degree	Institution	CGPA/%
July'16 – Present	B.Tech, MSE	Indian Institute of Technology, Kanpur	8.6/10.0
2016	AISSCE – XII	Delhi Public School, Rohini, New Delhi	96.4%
2014	AISSCE – X	Delhi Public School, Rohini, New Delhi	10.0 / 10.0

SCHOLASTIC ACHIEVEMENTS

- **Ranked 3** in the Materials Science Department, IIT Kanpur
- Secured **All India Rank 3983** in Joint Entrance Examination (JEE) Advanced 2016, among 1,90,000 candidates
- Secured **All India Rank 916** in Joint Entrance Examination (JEE) Mains, among 1.3 million candidates
- Awarded **Merit Certificate for scoring 96.4%** in All India Senior School Certificate Examination, class XII.
- Awarded the **KVPY Fellowship** by the Department of Science and Technology, Government of India.
- Appointed as **Head Boy, Delhi Public School Rohini** and spearheaded a 50 member School Cabinet.

RESEARCH EXPERIENCE

- **Aditya Birla Science and Technology Company** — Dr. Hemant Kumar Aiyer, Materials Team
  Summer Intern | Graphene Production from Industrial Grade Graphite — *June 2018 - August 2018*
  - Optimized operational parameters for synthesis of **high purity Graphite** from **Graphitic carbon ore**.
  - Drafted Design of Experiments to take account of **particle size** and **leach acid ratio** during refinement of ore.
  - Applied various analytical techniques such as **XRD** for structural analysis, **ICP-OES** for trace elemental analysis, **XRF** for impurities quantification, **Zetasizer (Dynamic Light Scattering)** and **Zeta Potential** for colloidal stability, to evaluate the quality of Graphite synthesized.
  - Implemented **Modified Hummers' Method** for **Graphene Oxide (GO)** synthesis followed by reduction and ultrasonic exfoliation to produce reduced Graphene Oxide (rGO).
  - Assessed and examined properties of as produced GO and rGO using tools like **XRD**, **FTIR, SEM Imaging**, followed by **Raman Spectroscopy** and **Solid-State NMR** for a detailed study of the integrity of carbon framework and defects generated.
  - Administered high-purity Graphene in **Graphene-epoxy resin** composites for developing **self healing**, **hydrophobic** and **anti-corrosive** coatings on Aluminium substrates.
- **Indian Institute of Technology Delhi** — Prof. Sameer Sapra
  Nano Group Intern | Perovskite Materials for Solar Cell Applications — *May 2017 - August 2017*
  - Optimized **Solid** and **Colloidal** phase synthesis techniques of bulk **Lead-based Trihalide Perovskites** and their nanoparticles for applications in **photovoltaic devices** and **detectors**.
  - Implemented protocols for doping Mn^{2+}, Cd^{2+} in Lead Halide Perovskite Nanoparticles in order to investigate the effects of transfer of **exciton energy from host to dopant atoms**.
  - Analysed data from Spectroscopic and Microscopic Characterization techniques such as **UV-visible measurements, PL Spectroscopy, Powder XRD** and **TRPL Decay Measurements** followed by **TEM Imaging** of doped and undoped samples to compare respective **nanoplatelet morphologies**.
  - Conducted trials for Co^{2+} doping in Cesium Lead Halide Perovskite Nanocrystals for exploratory purposes.

ACADEMIC PROJECTS

- **Balancing Fisherman Toy** — Prof. Vivek Verma
  Manufacturing Processes I, Department of Materials Science and Engineering, IIT Kanpur — *Jan 2018 - April 2018*
  - Worked in a team of **five** and devised a self-balancing toy model using techniques such as **gas welding, sheet metal working and casting**
  - Identified possible setbacks and eliminated technical errors in order to ensure proper balance of the assembly about a pivot
  - Adjudged '**Best Sectional Project**' by the Course Incharge for exceptional craftsmanship and attention to detail.
- **Mechanical Hacksaw Cutter-cum-Grinder** — Prof. J. Ramkumar
  Manufacturing Processes-II, Department of Mechanical Engineering, IIT Kanpur — *August 2018 - Nov 2018*
  - Built a mechanical hacksaw cutter model including a grinding attachment, in a team of **seven** to reduce effort during industrial cutting operations.
  - Fabricated and assembled eight gears along with other structural parts using techniques like **lathing, milling, drilling** etc.

EXTRACURRICULAR PROJECTS

- **Hiration Inc.** Mr. Anish Raj Sikka
  Intern | Beginner's Guide to Cryptocurrency *Dec 2017 - Jan 2018*
  - Surveyed literature on fundamentals of blockchain, cryptocurrency, trading and relevant exchanges
  - Consolidated useful information and charted guidelines to select from a large number of existing cryptocurrencies.
  - Drafted a simplified document to aid amateur investors in the arena of cryptocurrencies

RELEVANT COURSEWORK

A	Quantum Mechanics	A	Nature of Materials	A	Introduction to Electronics
A	Biomaterials	A	Thermodynamics	A	Manufacturing Processes-II
A	Mechanics of Solids	A	Characterization of Materials	A	General Chemistry Lab
O	Electronic Materials	O	Computational Methods	O	Phase Transformations

O: Ongoing, A: Excellent Performance

SOFTWARE SKILLS

- **Languages** : C, C++, Python, Bash.
- **Tools and Utilities** : Quantum Espresso, Origin, MATLAB, ImageJ, Autocad, Fusion360, Git, LaTeX, Microsoft Office
- **Operating Systems** : Windows, Linux, Mac-OS

POSITIONS OF RESPONSIBILITY

Senior Executive, President Student's Gymkhana Office, IIT Kanpur *April 2018 - Present*

- Part of a six member team responsible for the **planning** and **execution** of various initiatives concerning the welfare of the student community.
- Facilitated the implementation of **Senior Year Mentorship Program** for provision of career and academic guidance of first year students by senior year students.
- Addressed the grievances of different student bodies in front of **Institute Advisory Committees.** and the **Student's Senate** of IIT Kanpur.

Head Synchronicity, Antaragni'18, IIT Kanpur *April 2018 - Present*

- Coordinating the **Annual International Rock Music Festival** of **Antaragni**, one of the largest college festivals of Asia, organized annually by IIT Kanpur.
- Organised the preliminary rounds of the rock competition in nine major cities of **India** and **Nepal**, in order to attract talent from across the nation.

Senior Executive - Events, Entrepreneurship Cell, IIT Kanpur *April 2017 - April 2018*

- Collaborated with the E-Cell Team for promotion of **entrepreneurship** throughout the campus community and provided assistance to budding startups in association with **Small Industries Development Bank of India (SIDBI)**
- Managed numerous **events, hackathons** and **entrepreneurial talks** during the Entrepreneurship Summit organized at IIT Kanpur
- Arranged discussion sessions and workshops related to the **startup ecosystem** for upcoming entrepreneurs
- Structured and planned out activities for smooth organisation of **TEDx** at IIT Kanpur.

ACADEMIC REFERENCES

Dr. Hemantkumar Aiyer
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Materials Team,
Aditya Birla Science and Technology Centre
Email: hemantkumaraiyer@adityabirla.com
LinkedIn: https://www.linkedin.com/in/hemantkumar-aiyer-02629719

Dr. Sameer Sapra
Professor,
Department of Chemistry,
Indian Institute of Technology, Delhi
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