Indian Institute of Technology Delhi
School of Interdisciplinary Research (SIRe)

Project Proposal for Ph.D.

Project Details

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<tr>
<th>Project Title</th>
<th>Fabrication and characterization of air-stable batteries for on-chip applications</th>
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| Project Summary | The student will focus on processing of materials for air-stable batteries (Zn or other materials), assembly of CR2016 cells, characterization of cells (cycling, EIS, GCD, thermal stability, etc), fabrication of finalized layer geometries on silicon substrates in clean room, followed by characterization of the on-chip batteries. Significant amount of analysis and data reduction is expected. The processes employed may include solution-based processing, spincoating, thermal evaporation, sputtering, printing, lithography, etching, etc., which have their own protocols, which will need to be observed. |

Ph.D. Supervisors

<table>
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<tr>
<th>Role</th>
<th>Name of Faculty</th>
<th>Academic Unit in IITD/Institute/University</th>
<th>Email ID (Official)</th>
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<tbody>
<tr>
<td>Supervisor 1</td>
<td>Madhusudan Singh</td>
<td>Electrical Engineering</td>
<td><a href="mailto:msingh@ee.iitd.ac.in">msingh@ee.iitd.ac.in</a></td>
</tr>
<tr>
<td>Supervisor 2</td>
<td>Amit Gupta</td>
<td>Mechanical Engineering</td>
<td><a href="mailto:agupta@mech.iitd.ac.in">agupta@mech.iitd.ac.in</a></td>
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Project requirements (Student qualifications, experience required, etc)

*The candidate will be shortlisted based on common shortlisting criteria decided by ScRC (SIRe)*

- CSIR JRF (Physics/Chemistry), UGC (Electronic Science) or any other national level fellowship.
- M. Sc. (Physics, Chemistry or Electronic Science) or B. Tech/M. Tech (Engineering Physics, or Electrical Engineering, Chemical Engineering, Mechanical Engineering, or equivalent) with CGPA (or equivalent) >=7.
- Exclusive interest in experimental work (no serious interest in machine learning or computational work).
- Interest in an entrepreneurial career (startups) or industry will be a plus.

Source of fellowship/funding

(CSIR/UGC/DBT/ICMR/ICAR/NEET-PG/DST-INSPIRE/IRD/FITT Project details, if any)

Own Fellowship

Role of Faculty Members involved:

- **Supervisor-1** Battery materials development, solution-processed devices, cleanroom/lithography, material characterization.
- **Supervisor-2** Battery characterization methods, thermal evaluation and modeling.