



Project Proposal for Ph.D.

Project Details	
Project Title	Fabrication and characterization of air-stable batteries
Project Summary (Minimum 500 and maximum 2000 characters)	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). If the work shows promise, fabrication of finalized layer geometries on silicon substrates in clean room, followed by characterization of the on-chip batteries, may be also be attempted. Significant amount of analysis and data reduction is expected. The student is expected to be interested in commercialization of technologies developed. Fabrication of batteries, and processing of materials have their own protocols, which will need to be observed.

Ph.D. Supervisors			
Role	Name of Faculty	Academic Unit in IITD/Institute/University	Email ID (Official)
Supervisor 1	Madhusudan Singh	Electrical Engineering	msingh@ee.iitd.ac.in
Supervisor 2	Amit Gupta	Mechanical Engineering	agupta@mech.iitd.ac.in

Project requirements (Student qualifications, experience required, etc) *The candidate will be shortlisted based on common shortlisting criteria decided by ScRC (SIRe)
B. Sc. (or integrated M. Sc.) in Physics or Chemistry with CGPA>8 (or 80%). M. Sc. or M. Tech (received, or expected by June 2024) in Physics, Chemistry, Nanotechnology, Electrical Engineering, or Mechanical Engineering with CGPA>8. - Prior experience with electrochemical characterization techniques (EIS) and galvanostatic cycling of cells is desirable. - Primary 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)
Candidate with his/her own fellowship /institute assistantship

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.