The World's Energy Transition Hinges primarily on Storage

India needs indigenous, scalable, future-ready storage.
That’s what we’re building.

Core Thought

“R&D labs like ARCI should look beyond lithium-ion battery technology and develop technologies involving other alternative energy materials.”

Dr. G. Sundararajan
Former Director, ARCI

Multiple Echoes

“Cost of electrode materials contributes significantly to the overall cost of LiBs. As India is heavily dependent on imports, it has become essential to indigenously develop a technology and support industrial organisations in LIB technology.”

Dr. Tata Narasinga Rao
Director, ARCI

1983

Satish Mehta gets first L&T Merit Scholarship at IIT

1987

L&T project under Prof Juvekar gets Acharya PC Ray Award for development of indigenous technology

1992

Dr Dehmubed starts research in advanced semiconductor materials at Columbia University

2002

Prof Joglekar starts teaching Artificial Intelligence

2010

Prof Juvekar announced as L&T Chair Professor

2015

ARCI research on carbon resizing in Li chemistry

2020

IITac announces Research Centre for Photovoltaics & Batteries

2025

Go Power Technologies in Delhi, Go Anytime Ltd in London, Go Goa Ltd in Goa

2025-32

Global leadership target - AI derived novel materials for storage systems

Go Power Promoters

Dr Jyoti Joglekar
Distinguished Fellow - Artificial Intelligence

Dr Vinay Juvekar
L&T Chair Professor - IIT Bombay

Dr Rohinton Dehmubed
Distinguished Fellow - Semiconductors

Alumni Mentor

iit ALUMNI COUNCIL

Deputed by the Global Board of the IIT Alumni Council to guide the startup through setup, licensing, funding, and strategic alliances.

The IITAC initiatives stand on the shoulders of mentors and mission-driven engineers — united by the sovereign vision of nation-building.

Satish Mehta
Alumni Mentor
Life Fellow, IIT Alumni Council

First recipient of the L&T Merit Scholarship at IIT (1983–87), Satish worked under Prof. Juvekar for his BTech project and was awarded the Acharya P.C. Ray Award by the President of India in 1987 for contributions to fertiliser equipment and process development at L&T—alongside Prof. Juvekar, Prof. R.A. Mashelkar, and Prof. M.M. Sharma.

North AMERICAN Newsline
The Indian Eye

IIT Alumni Council confers Distinguished Fellowships to four eminent researchers

PanIIT grants honor on four for their original contribution to the development of key platform technologies

Dr. Kapil Talwar

Dr. Arindam Bose

Dr. Jyoti Joglekar

Dr. Rohinton Dehmubed

OUR BUREAU

New Delhi

IIT Alumni Council announces institutional strengthening of PanIIT Institute, an independent and autonomous partner alumni organization engaged in the development of an end-to-end deeptech Research Ecosystem in India – through the appointment of Distinguished Fellows in four key areas of Applied Science and Engineering.

"Excellence, nor mere competence is the hallmark of a Distinguished Fellow. The Distinguished Fellow program of the PanIIT Institute identifies, evaluates and awards the most distinguished alumnus from among i2Net institutions in each area of applied sciences and engineering. The focus is not just on publication of research papers and filing of patents but on actual commercial implementation of key platform technologies that find application across multiple products or services." said Ravi Sharma, President and Chief Volunteer of the IIT Alumni Council.

Dr Jyoti Joglekar has been selected by the jury as the most eminent alumnus in the area of holographic imaging and related AI & ML technologies. She has a PhD from IIT Bombay in Imaging AI & Analytics and is a leading global researcher in photogrammetry and remote sensing. Bleeding edge technologies developed by her find applications in a very wide range of industries from Agritech and disaster management to HealthTech and next generation diagnostics. "Fellowship is an honor for an academician. Thank you so very much for recognizing my contribution and honoring me for the same," added Dr Jyoti Joglekar.

Dr Rohinton Dehmubed received his B. Tech in Electrical Engineering from IIT Bombay and has a PhD in Electrical Engineering from Columbia University. He has led the development of core chipsets based on advanced materials such as Gallium Arsenide with newer options relying on Gallium Nitride and substrates such as diamond and sapphire. The chipsets are fabricated using epitaxies with crystal growth technologies such as Molecular Beam Epitaxy which could involve up to 36 material layers and sub-nanometer scale, multiple quantum well layers. "For any technologist, It is indeed a matter of pride to receive the Distinguished Fellowship from the IIT Alumni Council"

Dr Kapil Talwar has a PhD in Chemical Engineering from Washington University, Saint Louis, USA. He has a BTech in Chemical Engineering from IIT Bombay. He has been a researcher, serial entrepreneur and angel investor. He is involved in cutting edge research

Continued on next page... >>

IIT Alumni Council confers Distinguished Fellowships to four eminent researchers

companies both in India and overseas in the area of next generation catalysts that are used in the emerging bio economy and green chemistry-based substitutes for mainstay process plants. "Green chemistry can be very profitable even in India, if the regulators ensure a level playing field" added Dr Talwar.

Dr Arindam Bose is a silver medallist of IIT Kanpur, 1975 batch. He has spent over forty years in industry, finally as a Leader in Biotherapeutics Pharmaceutical Sciences at Pfizer Worldwide R&D. His area of specialization is monoclonal antibodies that have been found to be useful for treating many diseases such as arthritis, fatty liver, cancer and others which had no cure in small molecule based pharmaceutical products. He has personally led the development of several monoclonal antibodies that have received FDA approvals and was selected as the most eminent IIT Alumnus in this fast-emerging domain. "Biologics is one industry that India can lead in, especially monoclonal antibody based biotherapeutics", said Dr Bose.

The PanIIT Institute awards three types of Fellowships – Distinguished Fellowships, Life Fellowships and Honorary Fellowships. Distinguished Fellowship is the highest membership honor that the PanIIT Institute bestows upon its members. The Distinguished Fellowship is awarded to PhDs who have made significant contributions for the development of key platform technologies.

These technologies should have been successfully commercialized for applications across a wide range of products or services. Life Fellows are eminent industry experts. Honorary Fellows are global achievers who are not alumni of the IITs or other India Innovation Network institutions.

Dr. Jyoti Joglekar

Dr. Jyoti Joglekar holds a Bachelor of Electrical engineering from Walchand College of Engineering Sangli, a Master of Computer Engineering from Mumbai University and a PhD in Satellite Image Analysis from IIT Bombay. She has presented her research work in several International conferences of repute such as the International Society of Photogrammetry and Remote Sensing (ISPRS). Technology developed by her was an important constituent of some of the core data analysis applications developed with Chandrayaan-1 data by SAC, ISRO, Ahmedabad. She has over 25 publications in international journals and international conferences of repute. She is a reviewer of reputed international journals such as IEEE Transactions on Geoscience & Transactions on Remote Sensing (TGRS), IEEE letters, IEEE Access, IET etc. She has been honored as Fellow member of IETE (Institute of Electronics and Telecommunication Engineering) and is a Life Fellow on Computer Vision and Imaging AI at the PanIIT Institute. She is a member of the Board of Studies, Department of Computer Engineering, Mukesh Patel school of Technology, NMIMS, Mumbai, the Department of Information Technology, Cummins College of Engineering, Pune and Science college at SVU.

Dr Kapil Talwar

Dr Kapil Talwar holds a BTech in ChE from IIT Mumbai and a MS & PhD in Chemical Engineering from Washington University at St Louis. He has an MBA from Melbourne Business School. He has been a serial entrepreneur in the technology space having exited several start-ups to established Industry leaders.

Experience is concentrated around the confluence of business, science and technology, and include broad exposure to ancillary functions that support business growth. Professional Experience: Startup management, development and growth, capital raising, financial modelling and budgeting, investment due diligence, market strategy development, business development, corporate strategy, product planning, operations, program management.

Dr. Rohinton Dehmubed

Dr. Rohinton Dehmubed has over 30 yrs. experience in engineering design and product development in the field of telecommunications, RF, optics and compound semiconductors across multiple continents. He co-founded OPEL Inc. in 2001 which got listed on the Toronto Stock Exchange (currently trading under TSX: PTK) in June 2007. As Vice-President in charge of product development at OPEL he led the team to develop a complex III-V epitaxy for monolithic opto-electronic integration of optical communication devices for military and commercial applications. He has secured funding from private investors and government bodies and was on the board of directors of OPEL Inc. from 2005 until his departure in early 2007. Since then, he has been a mentor and an investor in Cheekotel Venture Fund., a long horizon deeptech fund focusing on the markets in India and other emerging markets and is a member of their advisory board. From 1997-2001, he worked at Transwitch Corporation in Shelton, CT, (NASDAQ: TXCC), where he was in charge of system development, definition and testing of high speed next-generation communication chipsets from DS3 (44Mhz) to OC-768 (40 GHz). Prior to Transwitch, he worked in the field of free-space optics and plume measurements at Electro Optical Sciences and Contel Corporation. During his time at Contel, he tested the earliest Erbium Fiber Optical Amplifiers and Semiconductor Optical Amplifiers for the Fiber-in-the-Loop application.

Dr. Arindam Bose

Dr. Arindam Bose retired from Pfizer Worldwide Research & Development in 2016 after 34 years in leadership roles in bioprocess development and clinical manufacturing. Dr. Bose's final position at Pfizer was Vice-President, Biotherapeutics Pharmaceutical Sciences with responsibility for external sourcing, competitive intelligence and external influencing as well as for executing the technical development plan for Pfizer's entry into biosimilars.

He is widely recognized as a Key Thought Leader in the biopharmaceutical industry. Dr. Bose was elected to the US National Academy of Engineering for innovations in biologics manufacturing. Dr. Bose currently provides consulting services in bioprocessing to several start-up biotechnology companies including a part-time process development management role at Akero Therapeutics. He received a Ph.D. in chemical engineering from Purdue University, a M.S. from the University of Michigan, Ann Arbor and a B. Tech from the Indian Institute of Technology, Kanpur.

Dr Arindam Bose has been a key mentor and coach to the engineered biomolecule initiative of the IIT Alumni Council.

Our Technology

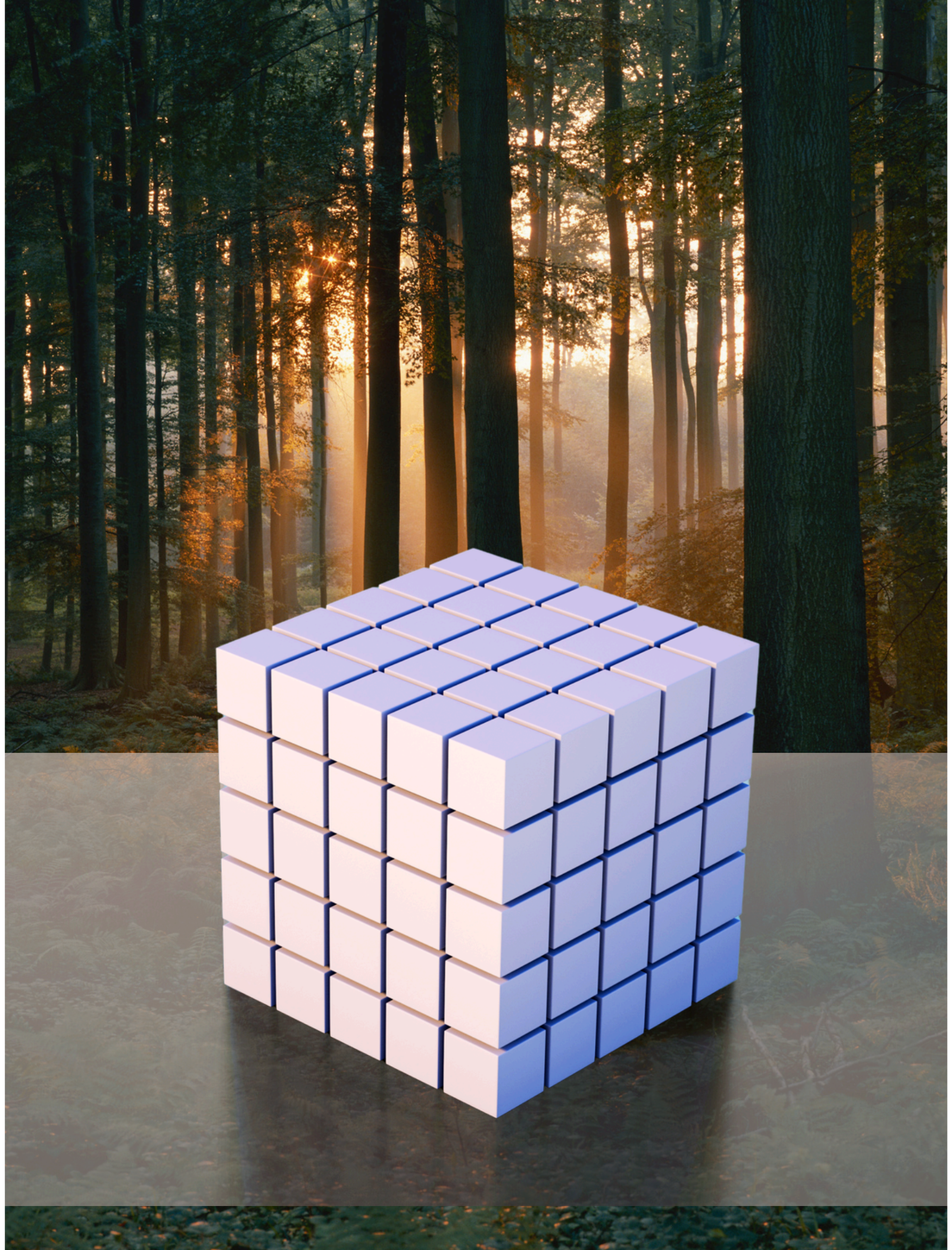
MEGACELL

The Building Block of India's
Storage Future

0.25 kWh per cell | Air-cooled | Stackable |
Modular | India-engineered bespoke materials

[Rs 999/-] plus taxes

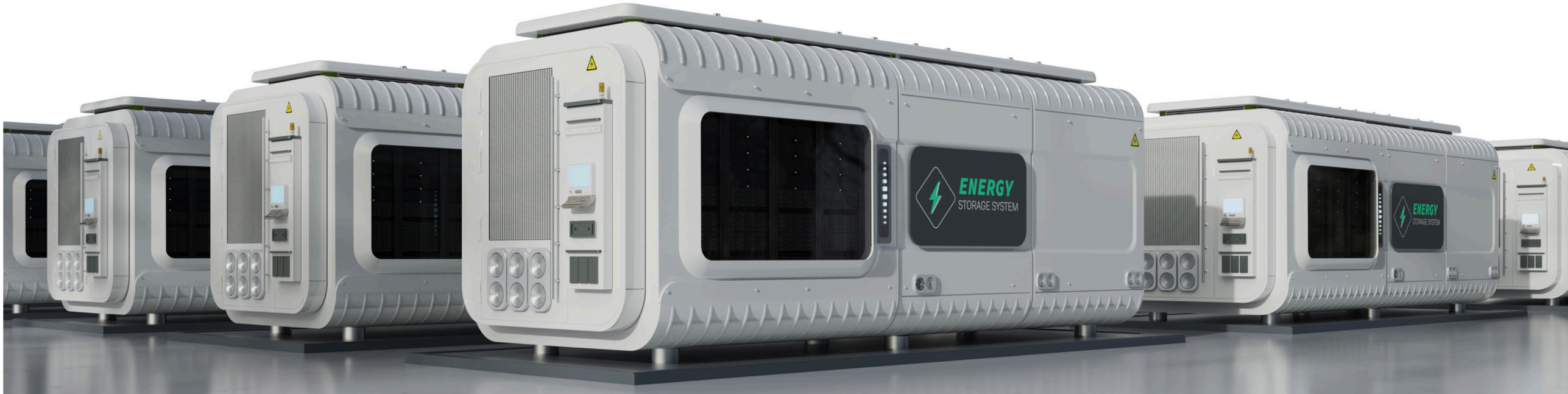
Picture shows a stack with 125 megacells.
Stack like a blade, a rubik cube or any other.



Storage is a Spectrum

with a Lead acid battery on one end and a super-capacitor on the other.

MegaCell can be tuned to operate across the entire spectrum. With designer properties and functionalities.

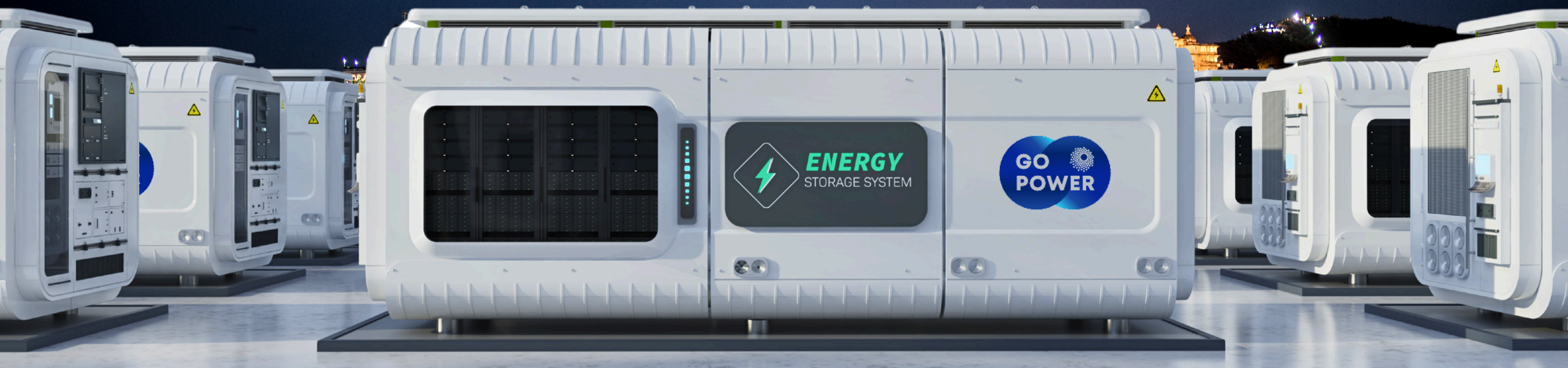


MEGACELL

AFFORDABLE

SCALABLE

DIFFICULT
TO REPLICATE



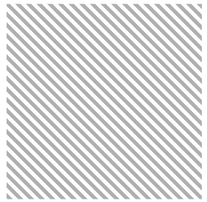
1 Affordable

Lower Total Cost

On commercial launch:
USD 30 per KWH capital cost of megacell | 98% round-trip efficiency
3x cycle life of LFP | Air-cooled even in a desert | Upto 50C charging

Lower the capital cost, longer the cycle life, faster the charging, better the round trip efficiency - lower the total cost (LCOE)

Current battery systems offer ~92% round-trip efficiency, require cooling, last 3–5 years with fast charging, with a capital cost of $100/kWh.



MegaCell aspires a 10x improvement in price performance over existing options.

2 Scalable

Within 3 years of Launch:
USD 15 per KWH | 99% round-trip efficiency
10x cycle life of LFP | Air-cooled even in a desert | Upto 100C charging

The price performance of purely chemical sytems like conventional batteries does not go down in future depending on improvements in manufacturing process.

By using a synthetic bespoke material and extensive AI control based on specialised micro-electronics, it is possible to continuously improve price performance.

3 Moat Around Castle

» Difficult to Replicate

As the MegaCell product range is still to be patented, it is not possible to reveal precise technical details.

The need for secrecy is only till the manufacturing equipment has been perfected.

Thereafter, without access to the equipment and operating software, it would be extremely difficult to replicate the functionality.

AI applications

help accelerate design and production of novel bespoke materials based on earth abundant raw materials through suitably designed frameworks.

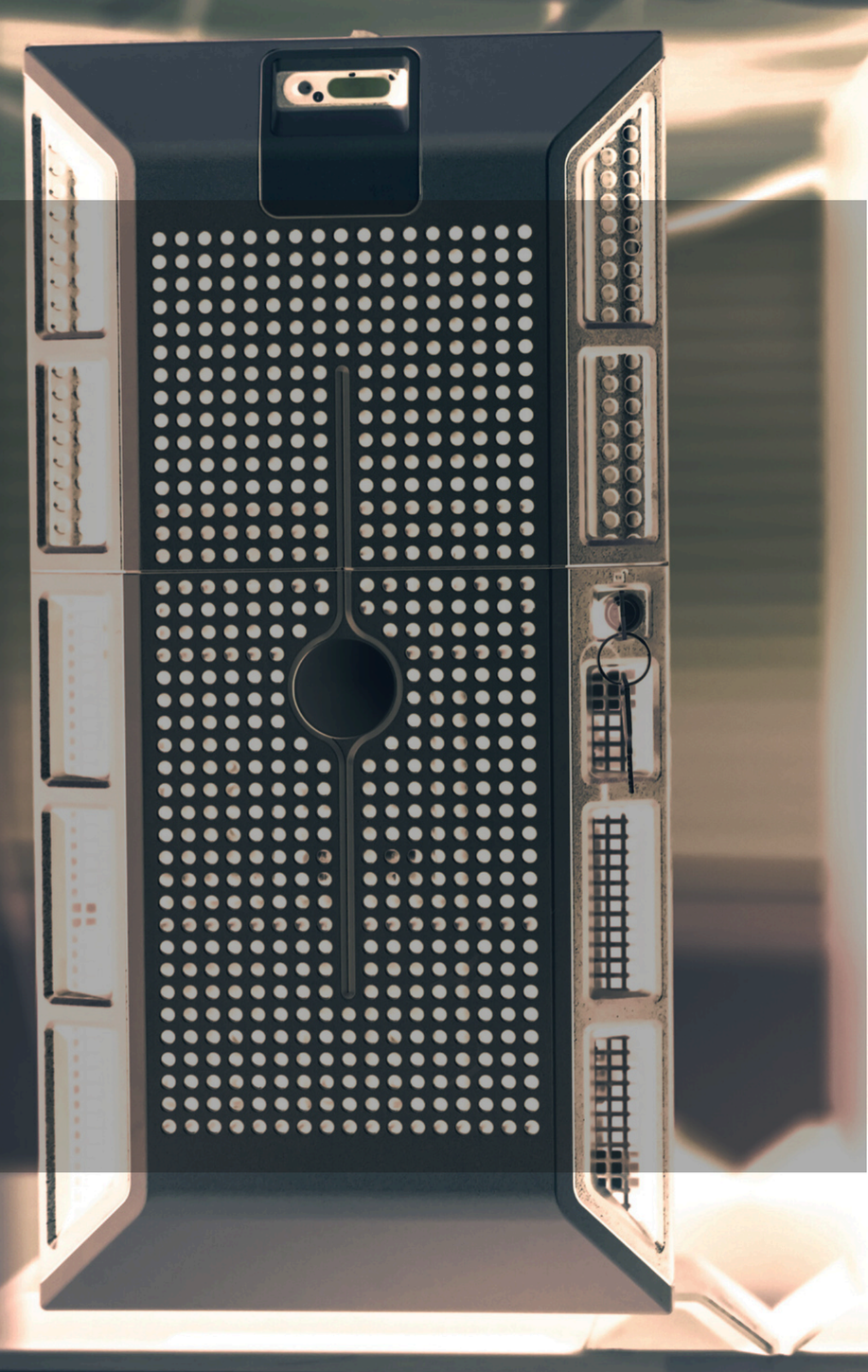
These include:
. Heuristic search
. Molecular dynamics simulation
. Density function theory
. With the AMAT AI platform (under alpha testing) as the foundational AI model being trained.

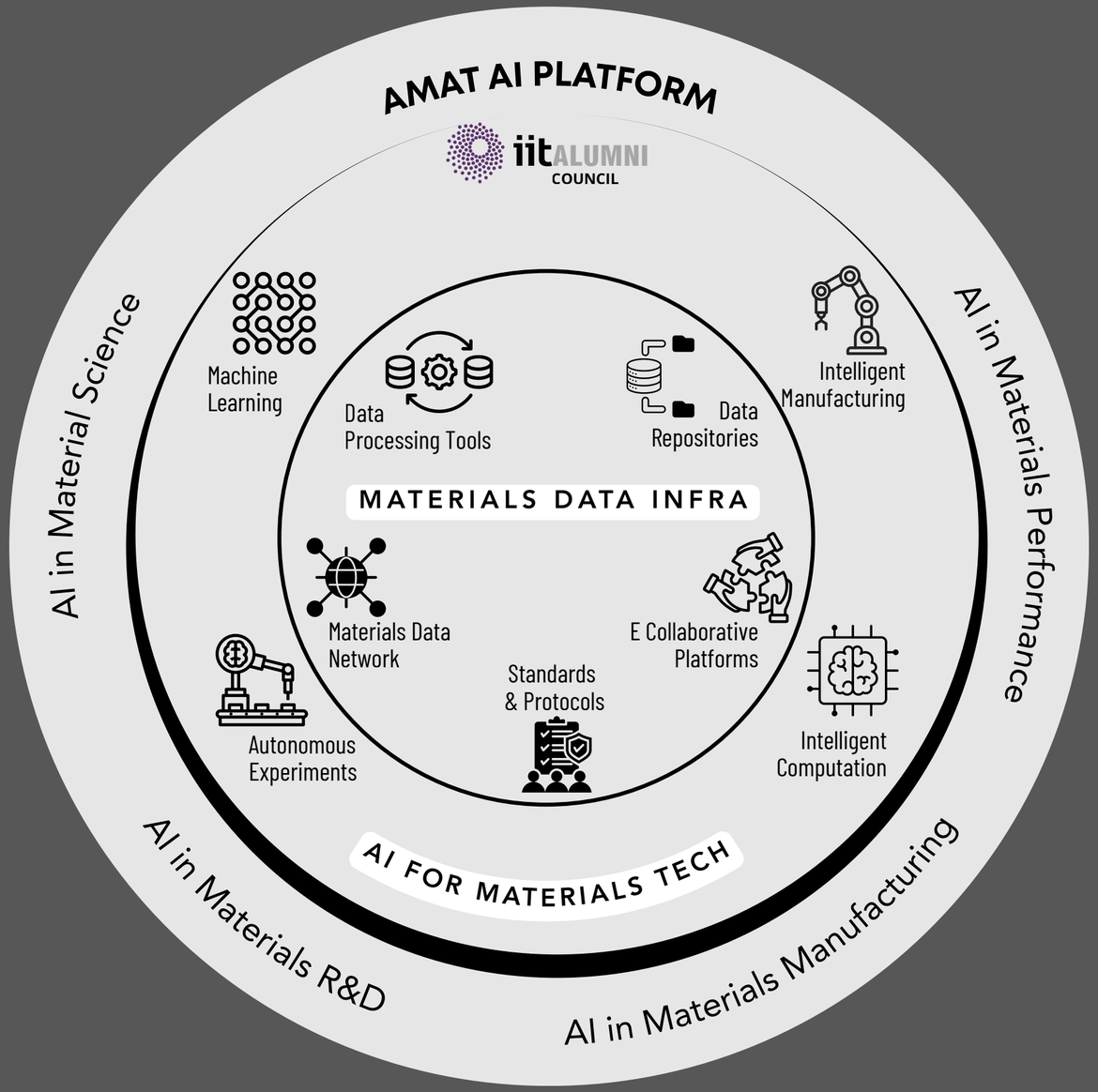
AI-designed storage block

Reimagining Energy Storage at the Molecular Level

We’ve applied data intelligence and proven chemical engineering methods to rearchitect energy storage by:

- Using a bespoke material base
- Modeling properties via AI-trained simulation
- Customising structure and performance by application use-case





iitALUMNI COUNCIL

AMAT AI Platform*

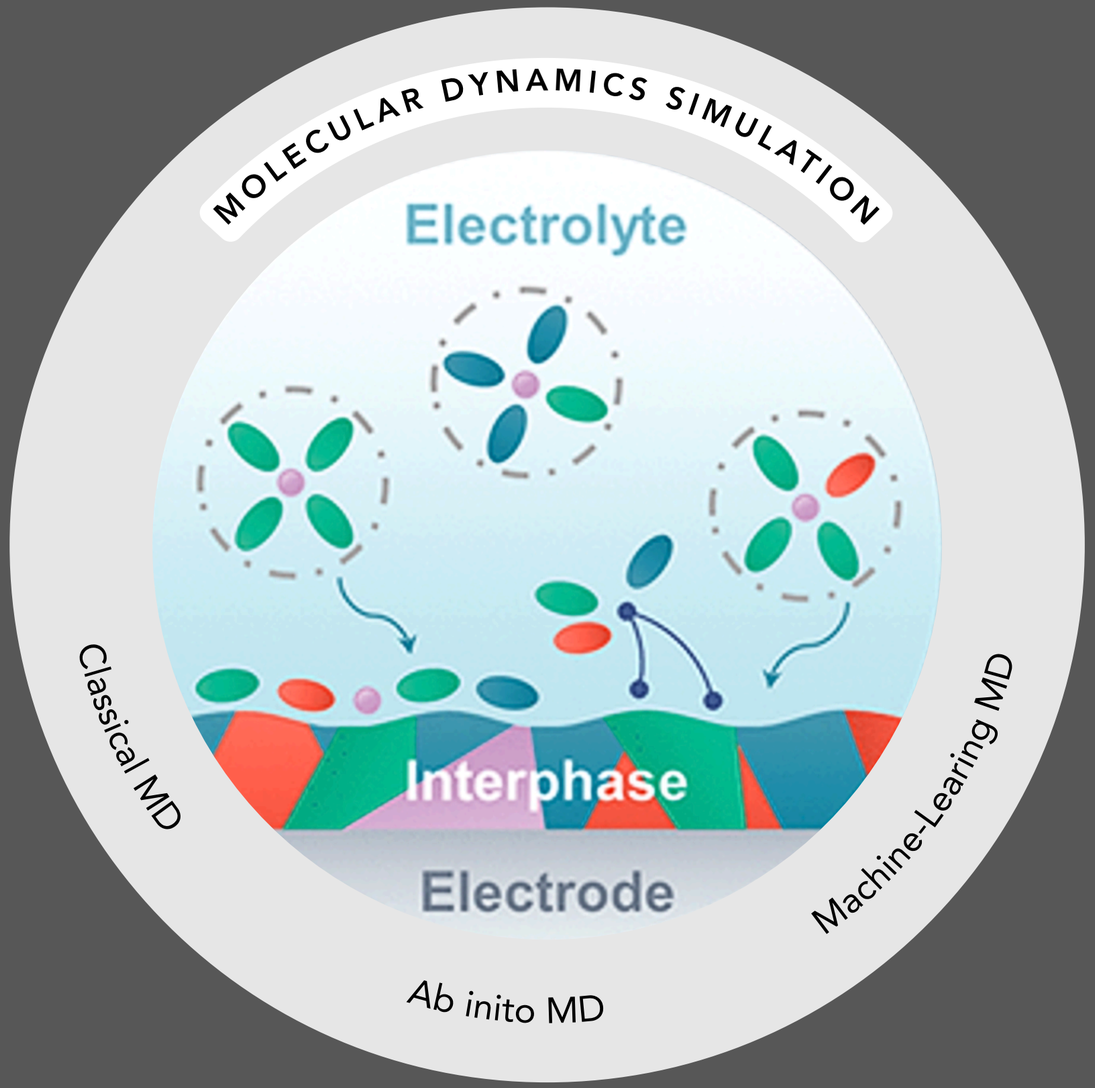
The Brain Behind Future Materials Evolution

Integrating data, simulation, and machine learning to accelerate performance-aware material design.

***An IIT Alumni Council supported initiative.**

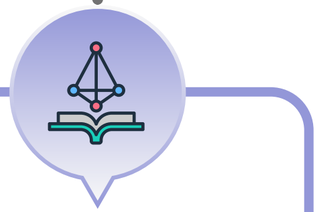
Where Chemistry Meets Computation

Simulating atomic-scale interactions across electrolyte, interphase, and electrode layers.



Ref: Farman, MdKhaja, et al. "AI-Enhanced Battery Management Systems for Electric Vehicles: Advancing Safety, Performance, and Longevity." E3S Web of Conferences. Vol. 591. EDP Sciences, 2024.

COMBINAITON OF AI & DENSITY FUNCTIONAL THEORY / DFT



Predicting Material Properties

Material Design

Understanding Material Interactions

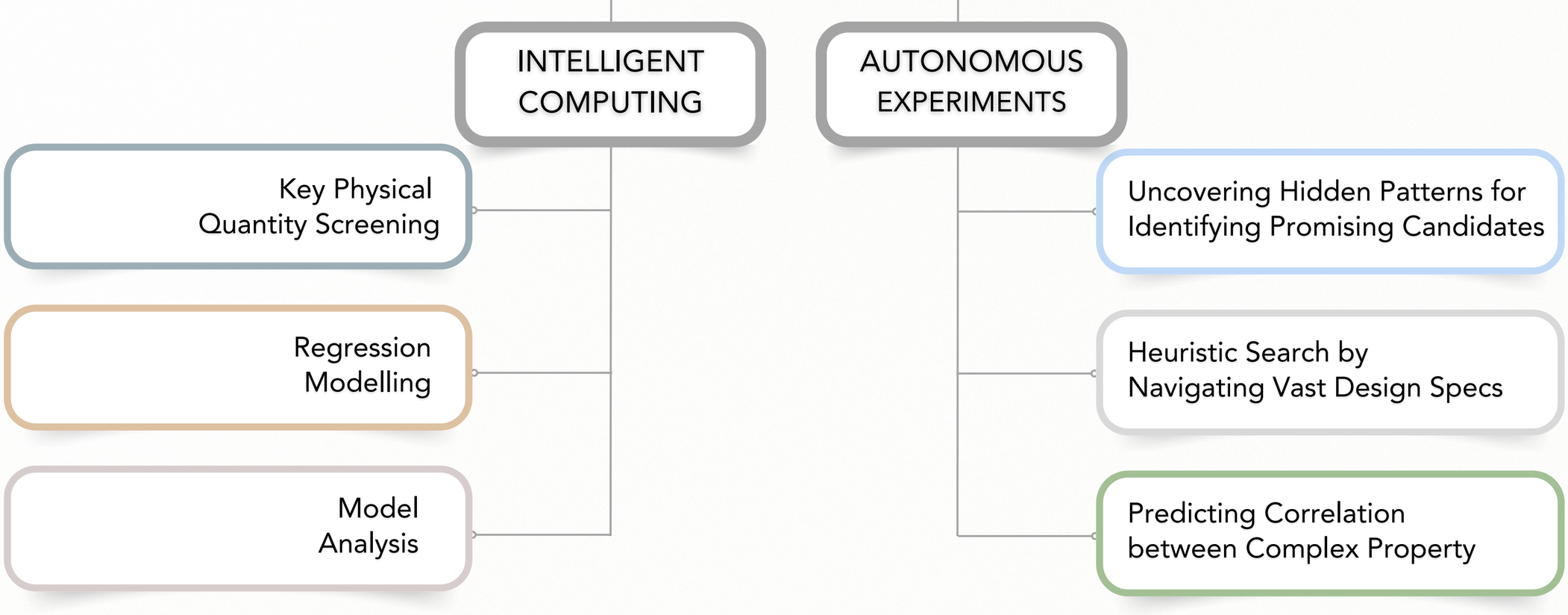
Accelerating Material Discovery

Predicting Stability & Energy Storage Properties

Creating a closed-loop system for predicting, designing, and optimising next-gen energy materials.

AI-DRIVEN MACHINE LEARNING STRATEGY FOR MATERIAL EVOLUTION

From inverse design to autonomous experimentation — modelling and validating at speed.



Perspective

Comprehensive effort on electrode slurry preparation for better electrochemical performance of $LiFePO_4$ battery

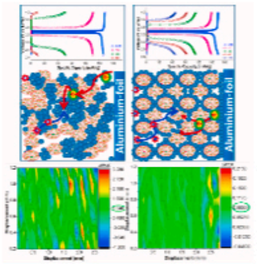
Kumari Konda [a,b], Sahana B. Moodakare [a,*], P. Logesh Kumar [c], Manjusha Battabyal [a], Jyoti R. Seth [b], Vinay A. Juvekar [b], Raghavan Gopalan [a]

[a] Centre for Automotive Energy Materials, International Advanced Research Centre for Powder Metallurgy and New Materials, IITM Research Park, Kanagam, Taramani, Chennai, 600113, India
[b] Department of Chemical Engineering, Indian Institute of Technology Bombay, Powai, Mumbai, 400076, India
[c] Department of Chemical Engineering, Indian Institute of Technology Madras, Chennai, 600036, India

HIGHLIGHTS

- Pre-mixing of carbon black-$LiFePO_4$ for electrode's desired microstructure.
- A novel "linearly resolved electrical resistivity measurement" technique.
- The homogeneity of the slurry is measured using rheological properties.
- Effective transfer of LFP properties to the electrode performance.

GRAPHICAL ABSTRACT



ARTICLE INFO

Keywords:
Lithium ion battery
Slurry preparation
Dry ball-milling
Rheology
Electrochemical performance
Linearly resolved electrical resistivity measurement

ABSTRACT

For a given proportion of active material, conductive agent, and binder, performance of the lithium ion battery depends on microstructure of the electrode. Uniform distribution of de-agglomerated particles of carbon black on the active material in the slurry is crucial for establishing a conductive network around the active particles and for improving the adhesion of the electrode to the current collector. Herein, we demonstrate that pre-mixing of carbon black and $LiFePO_4$ via dry ball-milling achieves the desired microstructure in the electrode coating. Homogeneity of slurry of $LiFePO_4$ in Poly(vinylidene fluoride)/N-methyl -2-pyrrolidone is demonstrated using measurement of viscosity and dynamic light scattering. Dried electrodes are shown to be uniform via SEM imaging and by a novel "linearly resolved electrical resistivity measurement" technique. Through peel tests it is shown that adhesion of the electrode to the current collector is improved. These improvements reflect in the electrochemical characteristics of the electrode such as increased cycling stability, higher exchange current density and ability of the electrode to perform at a higher C-rate. The electrodes prepared with this method, at an optimal composition, give a higher discharge voltage of ~3 V at 10 C compared to values of 2.4–2.8 V reported for unmodified $LiFePO_4$ so far.

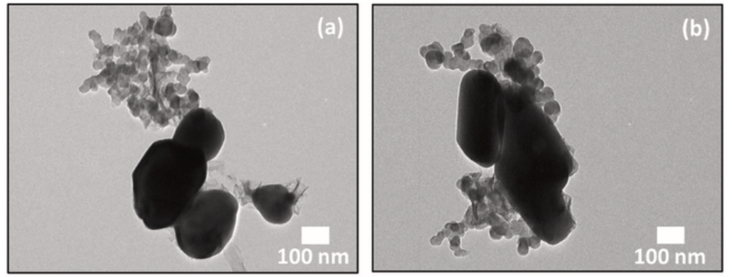


Fig. 4. TEM images of particles scraped from (a) WBM and (b) BM electrodes.

As part of the PhD project, the physical parameters of the carbon particles were altered extensively so as to achieve a 20% improvement in performance of the battery..

ACS APPLIED NANO MATERIALS

www.acsanm.org Article

Reduction Self-Assembly of Three-Dimensional Graphene Hydrogels: Implication as Adsorbents

Manimegalai Ganesan* and Vinay A. Juvekar

Cite This: https://dx.doi.org/10.1021/acsanm.0c02108 Read Online

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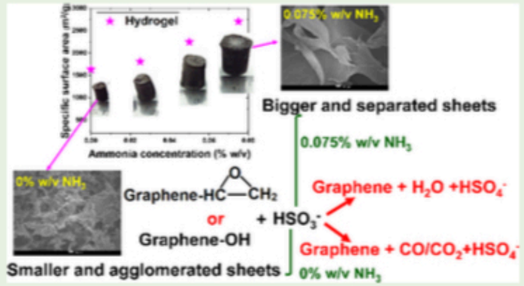
ABSTRACT: We have prepared a three-dimensional (3D) graphene hydrogel with a specific surface area that is comparable to the theoretical specific surface area of two-dimensional graphene. Graphene oxide was reduced in a glass vial using aqueous sodium bisulfite in the presence of ammonia, which regulates the rate of reduction. The kinetics of reduction was monitored by the rate of consumption of sodium bisulfite, whereas the extent of self-assembly of the reduced graphene sheets was captured through reduction in the volume of the 3D graphene with time. Dynamics of self-assembly shows two distinct regimes, namely, induction and shrinkage. During the induction period, no noticeable shrinkage in the volume occurs, although there is a significant reduction of graphene oxide. During the shrinkage period, the volume shrinks continuously with time until it reaches a constant value. The onset of shrinkage requires a critical extent of reduction of graphene oxide. We hypothesize that during the induction period, the overlapping portions of the sheets undergo lateral stacking and the reduced graphene oxide sheets undergo enlargement. With the increase in ammonia concentration, the rate of reduction is lower, the induction period is longer, and the extent of reduction at the onset of shrinkage is greater. This causes progressively greater enlargement of sheets as observed from the scanning electron micrographs of the lyophilized 3D aerogel. On further reduction, the larger sheets shrink slowly and to a lesser extent. The extent of stacking of larger sheets is also reduced significantly as seen from X-ray diffraction.



KEYWORDS: *3D graphene, reduction-self-assembly, induction period, shrinkage period, lateral stacking*

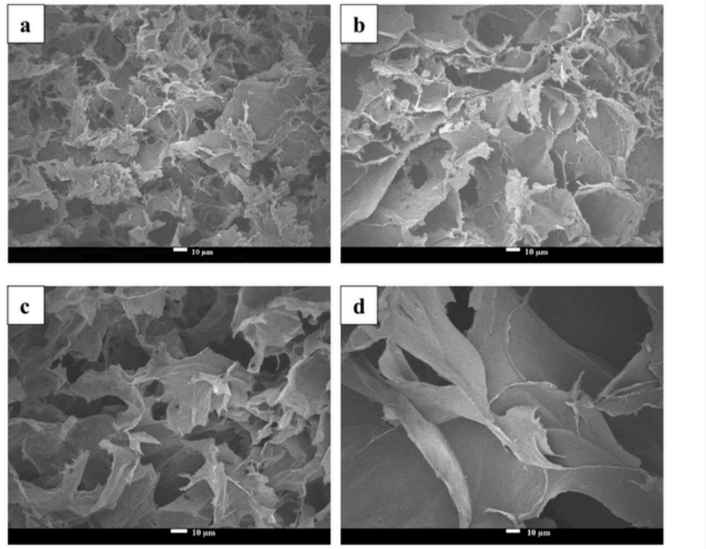


Figure 4. Field emission gun SEM (FEG-SEM) images of a three-dimensional graphene aerogel (scale bar: 10 μm): (a) Without ammonia (500×), (b) 0.025% w/v NH_3 (500×), (c) 0.05% w/v NH_3 (600×), and (d) 0.075% w/v NH_3 (500×).

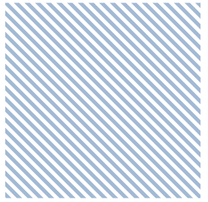
As part of the PhD project, a surface area of around 2800 sqm per gram was achieved.

Three dimensional Holey Graphene Electrodes

Vinay Juvekar and Per Löthman

Three dimensional (3D) graphene has properties such as high electrical conductivity, high surface area, and high electrical capacitance, which make them attractive as electrodes for electrochemical cells, capacitive deionizers and electrochemical supercapacitors. However, since graphene sheets act as ion-filters, they hinder diffusion of ions across them. This lacuna limits the thickness of 3D graphene electrodes, thereby reducing their cost effectiveness. By introducing nanometric size holes in the graphene sheets, it is possible to make the electrodes both thick and with high efficiency for ion transport. Important factors determining the efficiency is size and areal density of holes, and arrangement of holes on sheets. The optimal size and arrangement of holes provide ionic flow paths which produce uniform distribution of ions within the electrode without hindering their transport. In this talk, we discuss various aspects associated with preparation and optimization of 3D holey graphene electrodes.

Per Arvid Löthman, PhD received their education beginning in 1990, when they completed an MSc. in Materials Science&Engineering from FAU Erlangen-Nürnberg. Per Arvid then went on to participate in a study abroad program from 1995-1996 at Alfred University, where they studied Ceramic Engineering, Glass Science, and Ceramic Science. Finally, in 2014 they completed their Ph.D. in Macroscopic Magnetic Self-assembly from the University of Twente.



Assembly of molecular scale materials by magnetic self assembly opens up completely new vistas for fabrication of AI designed materials

Material Agility: Tunable across use-cases — from mobility to grid storage — by varying electrolyte + architecture.

AI Integration: Simulates, predicts, and accelerates innovation while reducing experimental costs.

Form-Factor Flexibility: Compact, air-cooled, and stackable — engineered for Indian environments and export-ready platforms.

Sustainability Embedded: Designed for recycling, low-toxic profiles, and future regulatory pathways.

Ionique Research is building a manufacturing pilot line for bespoke electrolytes based on the requirements of the MegaCell.

Location

Ionique is located in 75,000 sqft pilot plant and R&D centre in Noida near Delhi.

Our Ask

Phase 1: Prototype & Pilot Launch
Phase 2: Manufacturing + Field Testing
Phase 3: National Deployment + Licensing

Electrode mfg process & equipment development: 36 months from start of Noida plant (15.8.25).

Prototype mfg plant: 60 months from 1.1.25 with first prototype based on commercially available cells purchased from competitors in June 2026.

Pilot manufacturing line for marketing test/ trade show units: 24 months from first prototype (30.6.25).

Grid stabilisation installation for development of software - both internal management of the Battery box and external grid interfacing for duplex grid: 12 months from close of funding round.

Funding requirements: Approx Rs 300 crores for 60 months including pilot line.

Infrastructure requirements: Approx 80,000 sqft industrial unit with around 2,000 sqm open space, a in an urban industrial setting where the grid management and stabilisation system can be tested in live conditions

Lab support: IIT and CSIR campus for various testing and certifications (IITs dont use outside labs or agencies for certifications as they are themselves the last word in the area.
Specialised testing equipment: Approx Rs 8 crores to facilitate faster testing.

Powering India and beyond — over land, water, air, and orbit.

MegaCell