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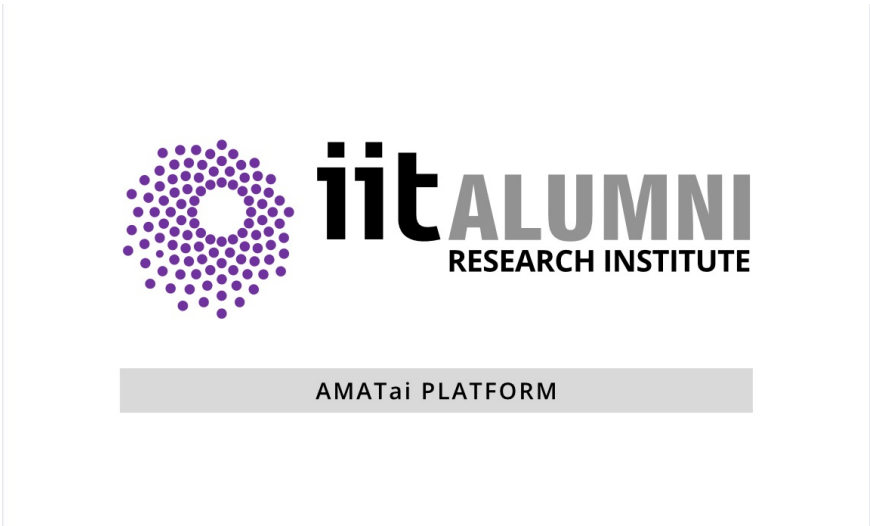
PRESS RELEASE

IIT Alumni Council to seeks industry partnerships to help mass manufacture novel materials created by AMAT AI platform.

- Elements like Lithium, Indium, Molybdenum, Cobalt etc occupy a unique position in the periodic table making them suited to certain applications.
- However many of these materials may not be earth abundant or indigenously available. Scaleability of batteries or solar cells based on these is in doubt.
- By drawing on data and expertise from the semiconductor industry, it is possible to replicate the functionality of scarce or expensive materials using coal, silicon or iron type abundant materials to replicate their functionality.



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New Delhi, May 22nd, 2025: IIT Alumni Council seeks industry partners to manufacture novel advanced materials at scale. These materials have been conceptualised by using paradigms from the semiconductor industry and their development has been accelerated by the use of the internet in general, and AI in particular. The AMAT AI platform -a foundational large material model, currently under development - targets to substitute lithium, cobalt, molybdenum, nickel, indium etc with earth abundant materials such as coal, thorium, silica and iron ore.

According to Ravi Sharma, President and Chief Volunteer of the IIT Alumni Council, "These projects typically envisage large investments, upwards of Rs 10,000 crores and will involve design and fabrication of the manufacturing equipment, as well as construction of large throughput process plants globally. IIT Alumni Council acts as the knowledge partner and is catalysing the creation of research startups through its social impact fund. These startups are being configured to fine-tune the technology and develop the process – specific to each version of the novel materials."

"Materials such as carbon can take on various form factors and functionalities – these range from lustrous diamonds to black coal and from superconducting graphene to carbon-based insulators. Similarly, silicon can be altered to act as a semiconductor by doping it. It is feasible to make compounds of silicon and carbon such as silicon carbide which can be the base for low-cost invertors and other devices. Zero gap semiconductors can disrupt many industries including air-conditioning, energy storage and steam turbines through new storage architectures, high efficiency thermos-electric generators (TEGs) and low cost, high life peltier cooling systems." According to Mr Jitendra Singh, Distinguished Fellow of the IIT Alumni Council in the area of value added carbon materials.

"The conceptualisation and mass manufacturing of novel materials based on green chemistry is possibly the first major visible contribution of AI to the world of material science. When coupled with additive manufacturing and industry 4.0 paradigms, it holds the potential to lead to a new age of sustainable, affordable, safe and high functionality materials. These can substitute corroding materials like ToR steel or expensive materials like food grade stainless steel." Added Mr Shashi Shekar, a keen environmentalist, former Secretary Water & Ganga Rejuvenation of the Govt of India and currently Vice Chairman of Acme Group, "The Govt under the Green Hydrogen Mission is pursuing decarbonisation of steel industry. Promotion of green steel using green hydrogen will

create circular economy and viable business models that may not depend on subsidies. By aligning with the IIT Alumni Council mission organisations, Acme Group plans to manufacture steel alloys that meet sustainability criteria and are also able to substitute more expensive steel alloys for specialised applications like additive manufacturing and process plant equipment."

"Last week Outokumpu delivered the first batch of specialty powdered stainless steel admixtures for use in 3D printing type systems. The material is being used to manufacture heat exchangers and other process equipment for demanding applications like aerospace and defence. It is indeed heartening to note that the IIT alumni Council managed to do both - predict the emerging trend well in time - and also start work in advance to create the complete ecosystem for industry 4.0 from the manufacture of carbon free green steel to the use of AI with a foundational large material model to create novel materials with identical corrosion resistance and physical properties using earth abundant materials.
It is a new age and a new paradigm which I am delighted to be a part of. I do look forward to the creation of the world's first process plant made entirely with equipment produced through additive manufacturing" Added Mr YPS Suri, former Managing Director of Outokumpu India. Mr Suri is a distinguished alumnus of IIT Kharagpur and a distinguished fellow of the IIT Alumni Council in the area of Stainless Steel. He has been featured in the book, "100 top IITians" by IIT Alumnus Commander VK Jaitly.

"Development of the AMAT Ai Platform has been aided by and contributed to by some of India's largest companies and their promoters. We would like to express our sincere thanks to all them, including the Tata Group, Birla Group, Jindal Group, Larsen & Toubro, Reliance Group, Adani Group, Arcelor Mittal, Ocior, Acme, Coal India, HPCL etc. We would also like to express our thanks to the National Solar Task Force members including Padma Sri Prof Ashok Junjhunwala, Prof Juzer Vasi, Prof Dinesh Kabra, Prof Anil Kothanyhayil and many others who contributed immensely to our understanding of the domain. Thanks are also due to our army of distinguished fellows, especially our distinguished fellows in AI led by Prof Jyoti Joglekar and our teams from Silicon Valley led by Dr Rohinton Dehmubed and Dr Milind Kulkarni. Without their active participation and thousands of hours of mantime contribution, none of this would have been possible. " said Satish Mehta,

Convenor of the IIT Alumni Social Fund.

About IIT Alumni Council

IIT Alumni Council is the largest global body of alumni across all the twenty-three IITs. The Council aggregates the technological and philanthropic resources of over 50,000 alumni spread across one hundred city chapters. The IIT Alumni Council aspires to catalyse India's technological renaissance. The Council supported initiatives are funded through the IIT Alumni Social Fund. Council members are aligned with the various mission organisations (social fund, alumni outreach and longevity missions) and mission facilitators (startup incubator, project management & advisory forum and research institute)

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About IIT Alumni Research Institute

IIT Alumni Research Institute is a mission organisation of the IIT Alumni Council. With over 500 distinguished fellows, over 250 industry partners and close to 100 academic partners – the Alumni Research Institute is establishing centres of excellence across twenty identified target industries, covering all the 64 advanced critical technologies.

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