



INDIAN INSTITUTE OF TECHNOLOGY MADRAS  
OFFICE OF ALUMNI AND CORPORATE RELATIONS

# Celebrating the Generosity of

*Dr. Ashok and Dr. Kamala Krishna*

Impact of your Giving in 2024

# Director's Message



*Prof. Kamakoti Veezhinathan*  
*Director, IITM*

Greetings!

IIT Madras continues to retain her top position for the ninth consecutive year, in the National Institute Ranking Framework, thanks to the world-class research, unwavering dedication and creative mindset of its faculty and students. The contribution and support of Alumni and well-wishers like you have crucially helped this standing and stature. Our achievements in research, education, innovation, and entrepreneurship have also earned us the recognition of an 'Institute of Eminence' as well as the top position in the Atal Innovation Ranking from the Government of India.

IIT Madras is making an indelible mark in promoting and providing education to students from the length and breadth of India to areas beyond Indian territory, through her initiatives in rural developmental educational programs, international, interdisciplinary M.Tech courses, and online diploma courses. The popularity and reach of our online courses can be gauged by the fact that around 25000 students in ages ranging from 17 to 82, have enrolled for these courses across national boundaries, and about 30% are from rural India. The institute, in a first-ever initiative by an IIT, has consolidated its position on the world map by establishing her international campus in Zanzibar, Africa where about 45 students have been admitted to different programs.

Innovation and entrepreneurship are ingrained in all our endeavours – our ambitious ventures in rocket and space explorations, the development of lab-grown diamonds, hyperloop, the Brain Research Centre etc, are a testimony to this. The start-up ecosphere is also a reflection of this spirit, wherein last year, 70 startups came to fruition, successfully nurtured by our centres of excellence, the Centre for Innovation, Nirmaan – the pre-incubator, the Incubation Cell, technology centres such as 'IITM-Pravartak' at the IIT Madras Research Park and others. This year, our target is to incubate at least a 100 Start-ups in various sectors. It is expected that at least 20% of the passing out students will be proud CXOs of their own ventures! The year 2023 also saw 221 national and 105 international patents from our Institute and we are looking to closing this current financial year with 366 patents, to account for 'a patent a day'.

Towards promoting inter-disciplinary research and exploring new frontiers, a Department of Medical Sciences and Technology was launched in May 2023, a School of Sustainability in Oct 2023, a Department of Data Science and Artificial Intelligence in Nov 2023 and a new Interdisciplinary Dual Degree program on Quantitative Finance in Dec 2023 through the synergy of the departments of Management Studies, Computer Science and Engineering and Mathematics. Our School of Sustainability has signed MoUs for collaborations with Tel Aviv University, Israel and Technische Universität Dresden, Germany, with the aim of being recognized as a leader for sustainability teaching and research in the global south.

Lofty ambitions and achievements are impossible without the deep-rooted faith and support of alumni and well-wishers like yourself. We are indebted to you for your bountiful, impactful contributions and the faith reposed on us. On behalf of IIT Madras, I express my deepest gratitude for continuing to strengthen the Institute. Together with your support, we are confident of building an IIT Madras that is more inclusive, diverse, and seized of tomorrow's needs to be nationally and globally relevant.

Thank you!

# Dean's Message



## *Prof. Mahesh Panchagnula* *Dean, Alumni & Corporate Relations, IITM*

Greetings from the Office of Alumni and Corporate Relations!

Please accept my sincere appreciation for the unwavering support you continue to provide to IIT Madras. Your generosity is the cornerstone of our success, and we are truly grateful for your commitment to the causes that are important to the students and faculty of IIT Madras. This report is a testament to the profound impact your contributions have had –by transforming the lives of students, supporting research, augmenting Institute infrastructure, enhancing learning or through supporting other myriad causes. Your trust in us propels our ambitions, and we are committed to ensuring that your donations are utilized to their fullest potential.

In a world evolving rapidly in science and technology, we have set ambitious goals for ourselves. Your enduring enthusiasm and support provide fillip to our efforts. IIT Madras stands as a beacon of diversity, sustainability, innovation and research excellence. While we have transformed over the years, our commitment to being a premier institute in the country and abroad, remains steadfast, attracting the brightest minds from across the globe. I cordially invite you to visit the campus, witness first-hand the salutary impact of your contributions, and observe the Institute's growth and evolution over the years.

Your generous gifts have made an incredible difference in our Institute's aspirations – Thank you! Your continued partnership is invaluable as we navigate the exciting journey ahead, shaping the future of India and the world together.



## *Dr. Ashok Krishna*

1974/BT/CH

2012 Distinguished Alumnus

Chairman & Co-founder

**THEMES**

(Thermal Mechanical Energy Storage)

## *Dr. Kamala Krishna*

1983/BT/CH



The report will present a thorough assessment of the impact that your contributions have made towards the causes outlined below:

*Chevron Visiting Chair*

*M S Ananth Institute Chair*

*Outstanding TA Awards in Dept  
of Chemical Engineering*

*1983 Batch Coral Reunion  
-P.V. Indiresan Faculty  
Externship Endowment*

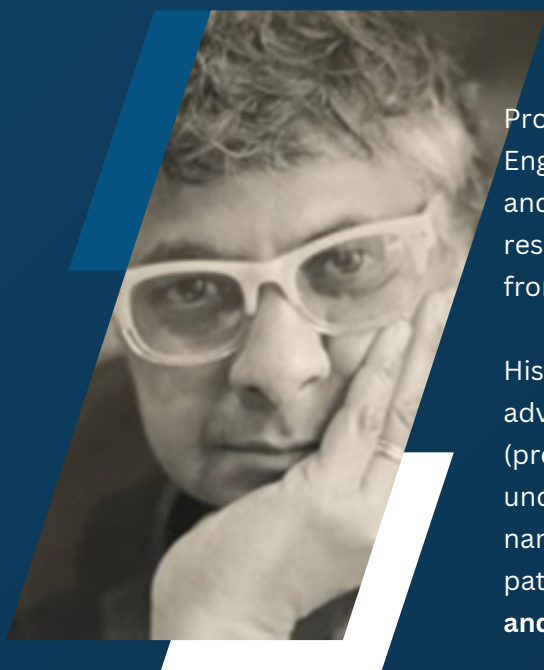
*1983 Batch Pearl Reunion -  
Prof. M. S. Ananth Endowment  
Fund*

*Project BrillhT Future*

# *Chevron Visiting Chair*

Chevron Chair was instituted in the department of Chemical Engineering by Dr. Ashok and Dr. Kamala Krishna's thoughtful contribution. The aim of this initiative is to host a well-known researcher for a period of a few weeks in IIT Madras. This Chair will facilitate short-term visits by accomplished researchers in various disciplines. The Chair will provide for airfare, local hospitality, and an honorarium. The recipients of the Chair participate in various academic and research activities and interact with faculty and students in IIT Madras.

## About Prof. Sanat Kumar



Prof. Sanat Kumar is currently the Bykhovsky Professor of Chemical Engineering at the Columbia University. He received his B.Tech (1981) and PhD (1987) in Chemical Engineering from IIT Madras and MIT, respectively. He was a faculty member at Pennsylvania State University from 1988 – 2002. Since 2002, he has been at Columbia University.

His research interests are in the field of polymers (nanocomposites, advanced capacitor materials, scattering methods) and biopolymers (protein-surface interactions). He has made seminal contribution on understanding the structure, assembly, and dynamics in polymer nanocomposites and thin films. He is an author of 300+ publications, 3 patents and an edited book, is a **fellow of the American Physical Society and the recipient of 2022 APS Polymer Physics Prize**.

He is an associate editor of Soft Matter and has had multiple leadership roles (Department Chair, APS Polymer Division Chair, and Polymer Physics Gordon conference chair among other) and has also held several other visiting professorships and editorial board membership. His current and future research focuses on hybrid inorganic-organic composite materials, ranging from enunciating their fundamentals to their application in a variety of critical sustainability contexts (gas/water separations, polymer upcycling).

## Impact of Prof. Kumar's Visit to IIT Madras

Prof. Kumar has been visiting the department of chemical engineering as a Chevron Visiting Professor for the last few years.

These visits lead to **active collaboration** with multiple research groups at IIT Madras. These collaborations have already produced **high impact journal publications** (Soft Matter 19, 4011 (2023), Nature 616, 731 (2023), ACS macro letters 11, 1102 (2022), Soft Matter 17, 2518 (2021), and few more under peer review). His visits has positively impacted in IITM's research activities and fostered sustainable international collaboration. He has delivered multiple seminars in the department, co-advised several MS PhD students, and organised a workshop. During his visits, he also serve as a mentor for early career faculty, and help in planning for career progression, effective teaching strategy development, and funding proposals.

# *MS Ananth Institute Chair*

## **CHAIR OCCUPANT:**



### **Academic Background:**

- B.Tech (1982) from the Indian Institute of Technology Madras
- MS (1984) and Ph.D. (1987) from the Indian Institute of Technology Kanpur

### **Theoretical and Computational Research**

His theoretical and computational research work is centered on the following three major areas: (i) Data Analytics and (ii) Monitoring and Control of Large Scale Networks with specific focus on water distribution systems, (iii) Design of processes for optimal integration of thermal and electrical energy

### **Data analytics:**

In data analytics my research focus is on the development of process models from data. In particular, I have been exploring the theoretical foundations of regression techniques used to build both steady state and dynamic models, especially in the errors-in-variables (EIV) framework.

**Prof. Shankar Narasimhan**  
*Department of Chemical Engineering*

My major scientific contribution to this area is on the rigorous treatment of noise in data. Specifically, I proposed a statistically rigorous approach for simultaneously extracting noise variances and a steady state model from process data using an iterative principal component analysis (IPCA) technique in 2004. Continuing this work further, I collaborated with my colleague (Prof. Arun Tangirala) on extending the same ideas for identifying linear dynamical models from data. We proposed a new approach called dynamic IPCA (DIPCA) for estimating the order, delay, error variances and model parameters of a single input single output (SISO) linear dynamic system [1]. During the last three years we have extended this technique for system identification in the following directions.

- DIPCA has been extended for identifying an ARX model of a SISO system in the EIV case [2].
- A method for identifying a linear dynamical state space model for a multi-input multi-output (MIMO) process in the EIV framework has been developed [3]. This approach can determine the order of the system, estimate the variances of errors corrupting measurements of all input and output variables, and estimate the model parameters.
- A method has been developed for identifying an EIV model for linear descriptor systems or systems described by linear differential-algebraic equations.
- A unified approach has been developed for identifying linear dynamical models under the EIV or non-EIV framework using generalized eigenvalue/eigenvector concepts.
- A general purpose toolbox in MATLAB for EIV/non-EIV model identification is under development, which incorporates all of the above ideas.

## Monitoring and control of water distribution systems

I have been working on the design and operation of water distribution networks for more than two decades, and during the last several years actively collaborated with my colleagues (Prof. Sridharakumar Narasimhan in my dept. and Prof. B.S. Murty in Civil Engg.) on monitoring and control of such networks. Specifically, optimal scheduling of water distribution networks with intermediate storage facilities for minimizing energy or operation time. The work on optimal scheduling of water distribution networks can be applied for operating rural water supply networks in India and many other developing countries, unlike continuously operated networks [4]. We were also part of a 5-year multi-institutional project on Sustainable Treatment, Reuse and Management for Efficient, Affordable and Synergistic Solutions for Water funded by Department of Science and Technology, which ended in 2023. In collaboration with International Water Agency (IWA) the centre published a book on Technological Solutions for Water Sustainability: Challenges and Prospects in which we contributed two chapters [5, 6]. Currently we are in discussion with L&T as well as Honeywell India to deploy some of our solutions for monitoring and management of water distribution networks.

## Design of processes for optimal integration of thermal and electrical energy

A landmark development in chemical engineering in mid 1980s was the development of Pinch Technology for design of heat exchanger networks to maximize thermal energy recovery. This technology has been developed further and refined over the last 40 years and is now being used routinely for design and retrofit of heat integration subsystems for refineries/petrochemical/fertilizer plants etc. In recent years there has been a drive to design sustainable chemical processes by reducing the use of fossil fuels in chemical industries and substituting it with electrical energy. In collaboration with Prof. Venkatarathnam in Mechanical Engg., our PhD student has developed a systematic extended pinch method for the design of processes for optimal use of thermal and electrical energy (work). We have shown that by applying this method for the design of vapour recompression assisted distillation columns (such as ethane/ethylene separation) thermal energy use can be significantly reduced by using compression work. Moreover the overall operating cost is also reduced. Similarly, in LNG liquefaction, process designs with lower specific energy consumption are obtained using the proposed procedure. This innovative design procedure has been described through publications in conference proceedings and journals [7, 8, 9]. We believe that this technology will make a significant impact in the near future to the design/retrofit of chemical processes involving work and thermal energy use. We have filed a provisional patent for vapour recompression column design and are in the process of filing two more patents.

## Other Activities

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### *Incubation:*

Provided strategic directions for the two companies I co-founded (Gyan Data Pvt. Ltd. founded in 2011 and GITAA founded in 2018). Both companies are providing valuable service and solutions for manufacturing companies in India and have been profitable for the last four years.

### ***PhD students supervised:***

Vuppanapalli Chaitanya, An Extended Pinch Analysis and Design Procedure for Workintegrated Heat Exchanger Network, submitted in May 2024 (co-supervisor Prof. G. Venkatarathnam)

### ***Sponsored Projects:***

Co-investigator in two proposed centres of excellence granted under IOE (1) Water and Sustainability Group and (2) Network Systems Learning, Control and Evolution Group.

### ***Consultancy Projects:***

- Lectures in Data Analytics, GITAA Pvt. Ltd., 2021-2024, Rs 10 lakhs
- Technical Advice for Data Analytics Projects, Gyan Data Pvt. Ltd., 2021-2024, Rs 10 lakhs

### ***Indian Patents:***

Low Carbon Cost-Effective Vapor Recompression Columns Design Using Extended Pinch Analysis, Application No. 202341078375, filed on 17/11/2023 (jointly with V. Chaitanya and Prof. G. Venkatarathnam)

### ***Invited Lectures:***

Plenary Lecture at Ninth Indian Control Conference titled "Errors-In-Variables Linear Model Identification – An Automated Approach Using Principal Components Analysis as the Foundational Piece," Vishakapatnam, 2023

### ***Publications:***

#### *References:*

[1] D. Maurya, A. K. Tangirala, S. Narasimhan, Identification of errors-in-variables models using dynamic iterative principal component analysis, *Industrial & Engineering Chemistry Research* 57 (2018) 11939–11954.

[2] D. Maurya, A. K. Tangirala, S. Narasimhan, Identification of errors-in-variables ARX models using modified dynamic iterative PCA, *J. of Franklin Institute* 359 (2022) 7069–7090.

[3] R. Keerthan, S. Narasimhan, Identification of errors in variables linear state space models using iterative principal component analysis, *Int. J. of Control* 96 (2023) 2773–2786.



[4] V. Kurian, M. Prasanna, C. Srinesh, S. Chinnusamy, S. Narasimhan, S. K. Narasimhan, Equitable supply in intermittently operated rural water networks in emerging economies, *Water Supply* 23 (2023) 4520–4538.

[5] S. K. Narasimhan, S. Narasimhan, S. M. Bhallamudi, A. Das, M. Mohankumar, Chapter 4 - Urban water infrastructure: current status and challenges in India, IWA Publishing, 2023, pp. 37–46.

[6] S. K. Narasimhan, S. Narasimhan, T. C. Dilly, A. Bakhshipour, U. Dittmer, Chapter 24 - Urban water infrastructure: distribution and collection, IWA Publishing, 2023, pp. 265–274.

[7] V. Chaitanya, S. Narasimhan, G. Venkatarathnam, A rigorous approach to address non-uniform heat capacity in pinch analysis, in: 26th Conference on Process Integration, Modelling and Optimisation for Energy Saving and Pollution Reduction (PRES26), 2023, pp. 28–33.

[8] V. Chaitanya, S. Narasimhan, G. Venkatarathnam, Optimization of a solvay cycle-based liquid air energy storage system, *Energy* 283 (2023) 129051.

[9] V. Chaitanya, S. Narasimhan, G. Venkatarathnam, A systematic method for performing pinch analysis of the liquid air energy storage (LAES) process, *Computer Aided Chemical Engineering* 52 (2023) 3123–3128.

[10] V. Kurian, S. Chinnusamy, A. Natarajan, S. K. Narasimhan, S. Narasimhan, Optimal operation of water distribution networks with intermediate storage facilities, *Computers & Chemical Engineering* 119 (2018) 215–227.

## *Outstanding Teaching Assistant Awards in Dept of Chemical Engineering*

**Criteria:** Selected TAs will be provided cash awards of Rs. 10,000, and will be enrolled in the TATP & TACP programs.



Aliasgar Mankada  
CA22M001



Subhan Kumar Pal  
CH19D015

Name	Roll No
Bhavikkumar Bhupendrakumar Mahant	CH19D752
Sairam S	CH19D023

# *M/s Chevron Products Company Prize*

M/s ChevronProducts Company Institute Merit Prize is awarded to the student with best academic record in 1st and 2nd semesters of M.Tech. programme in the Chemical Engineering Department. A silver medal and cash award of Rs.10,000/- is presented to the student. So far 8 students have received this prize during Institute Day.

<b>S.No</b>	<b>Name of the Student</b>	<b>Year Awarded</b>
1	Somtirtha Santra	2024
2	Talatam Leela Venkata Surya Sai Gay	
3	Marripelli Maniteja	2023
4	Jose Peter	2022
5	Sai Raghava Katturi	2021
6	Bhuvsmita Bhargava	2020
7	Faseeh K K	
8	Chadaram Sai Kishore	2019
9	Rinu Chacko	2018
10	Anbuchelvan Anamicca	2017
11	Vasudharini S V	2016
12	Aparna M	2015
13	Vaze Shruti Sanjay	
14	M P Resmi Suresh	2014
15	Amala M Mathai	2013

## *A Few Feedback from beneficiaries*



*I'd like to express my deep gratitude for the honor you've bestowed upon me. When I embarked on my journey at IIT Madras, I never anticipated receiving such a prestigious award at such a momentous occasion as Institute Day. I am genuinely thankful for this opportunity. My heartfelt thanks go to the donor of the prize for sponsoring this award and for acknowledging the efforts of master's students from the chemical engineering department. I also want to extend my appreciation to my department, professors, and fellow students for their support*

**-SOMTIRTHA SANTRA**



**-TALATAM LEELA VENKATA SURYA SAI  
GAY**

## *1983 Batch Coral Reunion-P.V. Indiresan Faculty Externship Endowment*

The faculty externship program is for the faculty who travel abroad for short durations to universities across the globe mainly for research purpose. 1983 batch named the faculty externship program in the memory of their Director Prof. P. V. Indiresan.



**Dr. P.V. Indiresan**

He started his teaching career in the University of Roorkee (it is now an IIT) and shifted to IIT Delhi soon after it was formed in 1961. He was later appointed Director of IIT Madras in 1978, and left an indelible mark on that Institute. He returned to Delhi after completing his term there, and then took to serious writing. In his middle age, he learnt a lot about Techno-Economics and was appointed on several committees constituted by the government as an advisor.

During his long and illustrious career, he received several honours and awards. Prof. Indiresan was awarded the IEEE honorary membership for 1998. He was also conferred Padma Bhushan by the President of India in the year 2000. He carried these awards lightly on his shoulders, and never made a mention of them. Humility was a hallmark of his persona.

## Objective:

- Evidence shows that research developed in collaboration with top global institutions have a 50% higher citation rate.
- A vital intention of this program is to enable a faculty member's first visit to the world's best research institutions abroad.
- This will create a virtuous cycle by increasing collaboration, improving the quality of research. This will improve the reputation of our faculty and institute, paving the way to attract new faculty and institutions interested in collaborating with IIT Madras in the future.

## Details:

- This program will enable young faculty members of IIT Madras per year to spend between four to eight weeks abroad at a world-class institution.
- IIT Madras will define the requirements of the faculty applicant and the selection process and report on results relating to ongoing collaboration, research, publications, citations, etc.

## Support provided to Faculty:

- This program will support expenses related to local hospitality as well as some local travel of the faculty.
- The cost of an externship per faculty will be between USD 6K to USD 8K depending upon the grant requested by the faculty.

## Selection Process for Faculty:

- The primary criterion for the selection process would be the merits of the applicant's research proposal.
- This Faculty Externship is currently being opened for all full-time Assistant Professors of IIT Madras.
- The steering committee will do the selection process in selecting and awarding the faculty with Faculty Externship every year, and they unanimously select a professor each year.

## *A Few Feedback from beneficiaries*



She will attend the conference on Gas-Liquid and Gas-Liquid-Solid Reactor Engineering (GLS-16), in Dresden ( Sept 2-6th 2024). In the July 2025, she will visit again for experiments.

### **Prof. Swapna Singha Rabha**

Department of Chemical Engineering  
Beneficiary of 2023

He visited Finland to analyse Himalayan aerosol and aerosol-in-snow samples via advanced instrumentations for understanding the mixing state of single particles in the aerosol mixture during the period of 15th Apr to 31st July 2024.



**Prof. Chandan Sarangi**  
Department of Civil Engineering  
Beneficiary of 2023



**Prof. V. Srinivasa Chakravarthy**  
Department of Biotechnology  
Beneficiary of 2020



**Prof. Himanshu Sinha**  
Department of Biotechnology  
Beneficiary of 2019

*Identifying the beneficiaries for 2024 is in progress*

## ***1983 Batch Pearl Reunion - Prof. M. S. Ananth Endowment Fund***

This Endowment Fund was established to honor Prof. M. S. Ananth, who served as the Director of IIT Madras from 2001 to 2011. He was well-known for his contributions to science and teaching, as well as his tireless efforts to develop higher education and research in India.

The following activities are supported through this endowment fund:

- To support the educational needs of the children of staff members Tech Kids who work on IITM campus.
- To support socially relevant projects

***To support the educational needs of the children of staff members Tech Kids who work on IITM campus.***

The Tech Kids daycare is run under the aegis of the IIT Madras Campus Welfare Trust and has been helped by generous contributions from the IIT Madras Alumni Association. The origins of Tech Kids trace back to the 1990s when the staff club ran it. A receptionist by the name Roja used to run it at the time with six children. Around 1997, with the initiative of Prof. Natarajan (then the Director), it received official recognition from the Institute. It was christened "Day Care cum Child Activity Centre (CAC)" with Prof. Hema Murthy as its first chairperson. It was initially run in a shed and employed a teacher and six helpers.

This year this endowment funds were used to help the children of the workers of the Tech Kids daycare.



**E. Joshva**  
S/O Margaret Mary

LETTER OF IIT MADRAS

Respected Sir/Madam,

I am E.JOSHVA son of MARGARET MARY My mother working in Tech kids IIT Madras. Thankyou for providing school fees. So I am able to study well. So that My school fees is not pending Thankyou for helping me to pay a school fee yearly we have gitted some rain relife items Thankyou Provisions/umberella, Bedsheet, Travel bag Thankyou so much, Thanking you

2018/01/01  
Tech kids  
Attender

your thankngly  
E.JOSHVA

I am R.Karthikeyan son of R. Abirami my mother working Tech Kids IIT Madras. Thank you for providing school fees. So I am able to study well. So that my school fees is not pending Thankyou for helping me to pay a school fee yearly. we have gitted some rain relife items Thankyou Provisions/umberella, Bedsheet Travel bag Thankyou so much,



**R. Karthikeyan**  
S/O R. Abirami

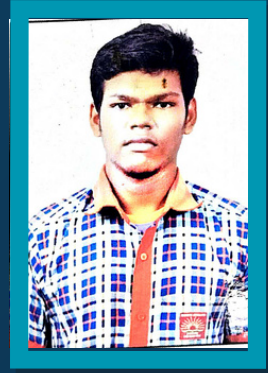


**Rakshana & Dhanush Kumar**  
D/S/O K Channamma

We are Rakshana & Dhanush Daughter & son of K. Channamma. My Mother is working in IIT Tech Kids centre. Thank you so much for providing us school fees. It helped us a lot. Just saying thanks its not enough. This help means a lot to us. We will remember this forever. Once again thank you!

Thank you for giving our fees money and  
my thank you very much in this situation you give  
money very usefully mam -

Thanks for giving bed sheet and bag, Umbrella  
and for house uses It's helping in house now so Thank  
to every mam.



**Deepak**  
S/O Sandhiya



**Kaviya & Ilakiya**  
D/O Padmavathi

I am Kaviya and Ilakiya daughter of padmavathi  
my mother working tech kids IT machines. Thankyou for  
providing school fees. so I can able to study well so  
my school fees is not pending. Thankyou to help my school  
fees and one more thanks for help my family in flood  
time provide hygiene items, bag, Umbrella and bedsheet.  
thanks for your help.

Thankyou

## ***Socially Relevant Projects***

Our team is working along with the principal in charge in developing a portal to collect the various proposals for the Socially Relevant Projects from various professors at our institute. Once this is complete, we will select the recipients after reviewing all the proposals.

# ***Project Brillght Future***

Our team is currently in the process of identifying the recipients.



**We are grateful to you!**

***Dr. Ashok and  
Dr. Kamala Krishna  
and Family!***

Thank you for your sustained generosity to IIT Madras over the years. Contributors such as yourself enable our students and Professors to dream big and work towards a better and brighter future. We hope you are proud of your alma mater and how it has remained steadfastly committed to academic and research excellence during and after your time here. You and your family have been instrumental in facilitating this significant growth.

Our efforts to nurture the culture of academic excellence that is the hallmark of IIT Madras - quality education, cutting-edge research, and unfettered creativity - shall continue. We are privileged and humbled to have you and your family walking with us along this trail. We wish you and your family the best always in all walks of life!



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