



# DEPARTMENT OF METALLURGICAL AND MATERIALS ENGINEERING NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

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*HEARTY WELCOME*  
*to*  
*MME*



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# THE DEPARTMENT – A GLANCE

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- Department started in **1967**
- Department offers
  - **B. Tech** in **Metallurgical and Materials Engineering (MME)(1967)**
  - **M. Tech** in Welding Engineering (1978), Materials Science and Engineering (MSE) (**1989**), Industrial Metallurgy (IM) (2011)
  - **M.S** (By Research) and **Ph.D.**
- **B. Tech MME** got accreditation for 5 years in 2007 and 6 years from July 2014 and **6 years from 2022.**
- **All M. Tech Programmes are accredited**
- First Ph.D. Produced – **1986**
- **QIP Center** for **PG and Ph.D** programmes
- **Three Professors** of our Department served as **the Directors of NITs**
- Got **Best Department Award** for the year **2009 and 2021**
- Leads the Institute with respect to “**sponsored projects**”

# Best Department awards



# Institute Vision and Mission

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## VISION

To be a university globally trusted for technical excellence where learning and research integrate to sustain society and industry.

## MISSION

- To offer undergraduate, postgraduate, doctoral and modular programmes in multi-disciplinary / inter-disciplinary and emerging areas.
- To create a converging learning environment to serve a dynamically evolving society.
- To promote innovation for sustainable solutions by forging global collaborations with academia and industry in cutting-edge research.
- To be an intellectual ecosystem where human capabilities can develop holistically.



# Department of MME - Vision and Mission

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## VISION

To evolve into a globally recognised department in the frontier areas of Metallurgical and Materials Engineering

## MISSION

- To produce Metallurgical and Materials Engineering graduates having professional excellence
- To carry out quality research having social and industrial relevance
- To provide technical support to budding entrepreneurs and existing industries

## DEPARTMENT FACULTY MEMBERS (REGULAR)

Faculty	Designation	PhD from	Expertise
<b>Dr. T. SRINIVASA RAO</b>	Professor, HAG ( <i>Former Director NITW</i> )	Bharathidasan University Trichy	Powder Metallurgy, Foundry
<b>Dr. S. RAMAN SANKARANARAYANAN</b>	Professor	Drexel, USA	Process Metallurgy, Quality Mgmt.
<b>Dr. B. RAVISANKAR</b>	Professor	Bharathiar University, Coimbatore	Metal Forming, Mechanical Behaviour
<b>Dr. S.P.KUMARESH BABU</b>	Professor	NIT Trichy	Foundry Metallurgy, Process Metallurgy
<b>Dr. S. KUMARAN</b>	Professor	NIT Trichy	Powder Metallurgy, Nano Materials

## DEPARTMENT FACULTY MEMBERS (REGULAR)

*Contd.,*

Faculty	Designation	PhD from	Expertise
<b>Dr. S. MUTHUKUMARAN</b>	Professor and Head	BIT Mesra	Welding, NDT
<b>Dr. N. RAMESH BABU</b>	Professor	IIT Madras	Biomaterials, Ceramics
<b>Dr. K. SIVA PRASAD</b>	Professor	IIT Madras	Mechanical Behaviour, Characterization
<b>Dr. S. JEROME</b>	Associate Professor	NIT Trichy	Welding, Composites
<b>Dr. NAGARAJAN.D</b>	Assistant Professor	The University of Queensland, Australia	Metal Forming Processes (Sheet and Bulk), Functionally Gradient Materials , Light Alloys Development
<b>Dr. KARTHIK.V</b>	Assistant Professor	IIT Kharagpur	Computational Materials Engineering, Surface Engineering, Nano Fluids



# DEPARTMENT FACULTY MEMBERS (REGULAR)


*Contd.,*

Faculty	Designation	PhD from	Expertise
<b>Dr.A.Muthuchamy</b>	Assistant Professor	IIT Madras	Composite materials, Welding
<b>Dr.-Ing. Prince Gideon Kubendran Amos</b>	Assistant Professor	KIT, Germany	Computational Materials Science
<b>Dr.Nimu Chand Reger</b>	Assistant Professor	MNIT Jaipur	Heat Treatment, Materials Science
<b>Dr. Illa Mani Pujitha</b>	Assistant Professor	IIT, Hyderabad	Energy storage batteries, carbon materials, Biopolymers, solid-state electrolytes
<b>Dr. S.Anand</b>	Assistant Professor	McMaster University, Canada	Modeling of Extractive Metallurgical Processes
<b>Dr.G.Vinothkumar</b>	Assistant Professor	Deakin University Australia	Alloy design, solid state reactions, grain boundary engineering

# FACULTY PROFILES

NAME	CONTRIBUTION
 <p><b>Dr. T SRINIVASA RAO</b> <b>(Professor (HAG))</b></p>	<p><b>Expertise:</b> Powder Metallurgy, Foundry  <b>Experience:</b> 38 (36 Years Academic + 2 Years Industry)  <b>Publications (Journals and Conferences) :</b> 101  <b>Projects ongoing / Completed:</b> 01/09  <b>Total Worth of Projects :</b> 8.80 Cr  <b>PhD Completed / Ongoing :</b> 07/01  <b>M.S Completed / Ongoing : -/-</b>  <b>M.Tech Completed / Ongoing :</b> 45  <b>Lab Established :</b> Powder Metallurgy Laboratory  <b>Addl. Responsibilities :</b> Nodal Officer (TEQIP), Head-MME, Head T&amp;P, PG Controller of Exams.  <b>Notable Achievement :</b> Director (NIT Warangal 2011 to 2016), BOYSCAST Fellowship  <b>Worth of Facilities Established:</b> 500 Lakhs</p>
 <p><b>Dr. S RAMAN</b> <b>SANKARANARAYANAN</b> <b>(Professor)</b></p>	<p><b>Expertise:</b> Process Metallurgy, Process Modelling, Quality Mgt.  <b>Experience:</b> 32 yrs  <b>Publications (Journals and Conferences) :</b> 50  <b>Projects ongoing / Completed:</b> 05  <b>Total Worth of Projects :</b> 41 lakhs  <b>PhD Completed / Ongoing :</b> 05 / 05  <b>M.S Completed / Ongoing :</b> 02  <b>M. Tech Completed / Ongoing :</b> 35 / 01  <b>Lab Established :</b> Process Modelling Lab &amp; Process Metallurgy Lab  <b>Addl. Responsibilities :</b> Head MME (2012-14), Asso. Dean (2006-07), Dean ID (2018-21)  <b>Notable Achievement :</b> Active Interface with Steel Industry  <b>Worth of Facilities Established :</b> 100 Lakhs during HoD tenure</p>


# FACULTY PROFILES

Name	Contribution
 <p><b>Dr. B. RAVISANKAR</b> (Professor)</p>	<p><b>Expertise:</b> Metal Forming, Super Plastic Deformation  <b>Experience:</b> 35 years  <b>Publications (Journals and Conferences) :</b> 120  <b>Projects ongoing / Completed:</b> 01 / 12  <b>Total Worth of Projects :</b> Rs. 400 lakhs  <b>PhD Completed / Ongoing :</b> 10 / 04  <b>M.S Completed / Ongoing :</b> 03/ 03  <b>M.Tech Completed / Ongoing :</b> 40 / 06  <b>Lab Established :</b> Metal forming Lab, ECAP and Diffusion Bonding  <b>Addl. Responsibilities :</b> Programme Co-ordinator M.Tech (MSE)  <b>Notable Achievement :</b> Recipient of Young Scientist Award  <b>Worth of Facilities Established:</b> Rs.150 lakhs</p>
 <p><b>Dr.S.P.KUMARESH BABU</b> (Professor)</p>	<p><b>Expertise:</b> Foundry, Corrosion Engg, Surface Engg.  <b>Experience:</b> 13 (Industry) + 12 (Teaching)  <b>Publications (Journals and Conferences) :</b> 90  <b>Projects ongoing / Completed:</b> 01 / 03  <b>Total Worth of Projects :</b> Rs. 370 lakhs  <b>PhD Completed / Ongoing :</b> 09 / 13  <b>M.S Completed / Ongoing :</b> 03 / 08  <b>M.Tech Completed / Ongoing :</b> 95 / 08  <b>Lab Established :</b> Foundry, Corrosion and Surface Engineering Lab  <b>Addl. Responsibilities :</b> HoD-MME, Head - CECASE  <b>Notable Achievement :</b> Got High value Project from CMPDI  <b>Worth of Facilities Established:</b> Rs.400 lakhs</p>

# FACULTY PROFILES



NAME	CONTRIBUTION
 <p><b>Dr. S. KUMARAN</b> (Professor)</p>	<p><b>Expertise:</b> Powder Metallurgy and Alloy Development  <b>Experience:</b> 23 yrs + 1 yr (Industry)  <b>Publications (Journals and Conferences) :</b> 161  <b>Projects ongoing / Completed:</b> 03 / 20  <b>Total Worth of Projects :</b> 11.43 Cr  <b>PhD Completed / Ongoing :</b> 21 / 15  <b>M.S Completed / Ongoing :</b> 2/0  <b>M.Tech Completed / Ongoing :</b> 75 / 00  <b>Lab Established :</b> Powder processing, Energy materials  <b>Addl. Responsibilities :</b> Warden, NITFEST, METTLE- staff advisor, HoD-MME (2018-2021)  <b>Notable Achievement :</b> BOYSCAST fellowship  <b>Worth of Facilities Established:</b> 600 lakhs</p>
 <p><b>Dr. S. MUTHUKUMARAN</b> (Professor and Head)</p>	<p><b>Expertise:</b> Welding, NDT  <b>Experience:</b> 19 yrs  <b>Publications (Journals and Conferences) :</b> 72  <b>Projects ongoing / Completed:</b> 02 / 05  <b>Total Worth of Projects :</b> 150 lakhs  <b>PhD Completed / Ongoing :</b> 07 / 07  <b>M.S Completed / Ongoing :</b> 02 / 04  <b>M.Tech Completed / Ongoing :</b> 65 / 09  <b>Lab Established :</b> Advanced Welding Lab &amp; NDT Lab  <b>Addl. Responsibilities :</b> HoD-MME (present), Department Co-Ordinator B.Tech NBA, Head –IPR,  <b>Notable Achievement :</b> PI of Indo – UK Newton -Bhabha Project  <b>Worth of Facilities Established :</b> 150 Lakhs</p>

# FACULTY PROFILES

NAME	CONTRIBUTION
 <b>Dr. N. RAMESH BABU</b> <b>(Professor)</b>	<p><b>Expertise:</b> Biomaterials, Ceramic Materials</p> <p><b>Experience:</b> 17+ yrs</p> <p><b>Publications (Journals and Conferences) :</b> 100+</p> <p><b>Projects ongoing / Completed:</b> 11/01</p> <p><b>Total Worth of Projects :</b> Rs 350 lakhs (As PI)</p> <p><b>PhD Completed / Ongoing :</b> 10 / 05</p> <p><b>M.S Completed / Ongoing :</b> 01/ -</p> <p><b>M.Tech Completed / Ongoing :</b> 40 / 03</p> <p><b>Lab Established :</b> Biomaterials, Ceramic Materials and Advanced Characterization Lab (XRD &amp; ESEM)</p> <p><b>Addl. Responsibilities :</b> Assoc. Dean (R &amp; C) (2015 - 2017), Dy. Registrar(R &amp; C) (2017-2020)</p> <p><b>Notable Achievement :</b> Best PhD Award, Best Paper Awards, Indo-Russia Joint Projects</p> <p><b>Worth of Facilities Established:</b> 600 lakhs</p>





# FACULTY PROFILES



NAME	CONTRIBUTION
 <p><b>Dr. K. SIVA PRASAD</b> <b>(Professor)</b></p>	<p><b>Expertise:</b> Mechanical Behaviour, Materials Characterization, Metal additive manufacturing.  <b>Experience:</b> 15 yrs  <b>Publications (Journals and Conferences) :</b> 170  <b>Projects ongoing / Completed:</b> 03 / 05  <b>Total Worth of Projects :</b> 2.0 Cr  <b>PhD Completed / Ongoing :</b> 11 / 06  <b>M.S Completed / Ongoing :</b> 02 / NIL  <b>M.Tech Completed / Ongoing :</b> 40 / 04  <b>Lab Established :</b> Advanced Materials Processing Lab  <b>Addl. Responsibilities :</b> Ex - Asso. Dean (R &amp; C) (2012 – 15), Ex-member Hospital committee  <b>Notable Achievement :</b> Recipient of SDT – TRA Faculty Fellowship, ASEM-DUO faculty fellowship  <b>Worth of Facilities Established:</b> 100 lakhs</p>
 <p><b>Dr. S. JEROME</b> <b>(Associate Professor)</b></p>	<p><b>Expertise:</b> Welding Engineering, Wire Arc Additive Manufacturing  <b>Experience:</b> 16 yrs  <b>Publications (Journals and Conferences) :</b> 40  <b>Projects ongoing / Completed:</b> --/ 04  <b>Total Worth of Projects :</b> Rs 80 lakhs  <b>PhD Completed / Ongoing :</b> - 04/ 06  <b>M.S Completed / Ongoing :</b> - 01/ 02  <b>M.Tech Completed / Ongoing :</b> 70 / 08  <b>Lab Established :</b> Welding Lab  <b>Addl. Responsibilities :</b> Convener of Hostels (2012-15) &amp; Assoc. Dean (2012-15 &amp; 18-20)  BoG Member (2020-22), Treasurer RECAL (2022 onwards)  <b>Notable Achievement :</b> Subject Expert – Additive Manufacturing Group –Indian Air force  <b>Worth of Facilities Established :</b> Rs.60 Lakhs</p>





# FACULTY PROFILES

NAME	CONTRIBUTION
 <p><b>Dr. Nagarajan D</b> <b>(Assistant Professor)</b></p>	<p><b>Expertise:</b> Metal Forming Processes (Sheet and Bulk), Functionally Gradient Materials, Light Alloys Development  <b>Experience:</b> 11 yrs  <b>Publications (Journals and Conferences) :</b> 19 / 17  <b>Projects ongoing / Completed:</b> 03 / 01  <b>Total Worth of Projects :</b> 169.27 Lakhs  <b>PhD Completed / Ongoing :</b> -- / 05  <b>M.S Completed / Ongoing :</b> --/ 01  <b>M.Tech Completed / Ongoing :</b> 16 / 05  <b>Lab Established :</b> - MTLR35 - Metal Forming and Particulate Processing Laboratory  <b>Addl. Responsibilities :</b> Faculty In-charge for Dept. Time table and MIS, Faculty Advisor - MMEA  <b>Notable Achievement :</b> - Developed rocket nozzle for ISRO project &amp; Best Performer Award for AY2022-2023 from NITT.  <b>Worth of Facilities Established:</b> - Lab MTLR35 – INR 75 Lakhs; Research – INR 105 Lakhs</p>
 <p><b>Dr. Karthik V</b> <b>(Assistant Professor)</b></p>	<p><b>Expertise:</b> Computational Materials Engineering, Surface Engineering, Nanomaterials  <b>Experience:</b> 05 yrs  <b>Publications (Journals and Conference Proceedings) :</b> 08 / 12  <b>Projects ongoing / Completed:</b> - 02/ --  <b>Total Worth of Projects :</b> - 26.0 lakhs  <b>PhD Completed / Ongoing :</b> - -/05  <b>M.S Completed / Ongoing :</b> - Nil  <b>M.Tech Completed / Ongoing :</b> - 16/07  <b>Lab Established :</b> - Polymer and Composite Laboratory  <b>Addl. Responsibilities :</b> - Class committee Chairman (2020-2024 Btech MME), Warden (Zircon-C and Beryl Hostels), Faculty Advisor (Task Force Club)  <b>Notable Achievement :</b> - Best Performer Award 2022 from NITT  <b>Worth of Facilities Established:</b> - 48.0 lakhs (Capital Fund)</p>



# FACULTY PROFILES

NAME	CONTRIBUTION
 <p><b>Dr. A. MUTHUCHAMY</b> (Assistant Professor)</p>	<p><b>Expertise:</b> Physical Metallurgy, Powder Metallurgy, Welding Process and Metallurgy, Direct-energy deposition</p> <p><b>Experience:</b> 8.5 Years</p> <p><b>Publications (Journals and Conferences) :</b> 28 + 2</p> <p><b>Projects ongoing / Completed:</b> 01</p> <p><b>Total Worth of Projects :</b> Rs. 15 lakhs</p> <p><b>PhD Completed / Ongoing :</b> 00/01</p> <p><b>M.S Completed / Ongoing :</b> -</p> <p><b>M.Tech Completed / Ongoing :</b> 03/01</p> <p><b>Lab Established :</b> Welding Simulation Laboratory</p> <p><b>Addl. Responsibilities :</b> Ph.D. &amp; MS Admission Coordinator</p> <p><b>Notable Achievement :</b> -</p> <p><b>Worth of Facilities Established:</b> 4.3 Lakhs</p>
 <p><b>Dr. -ING PRINCE GIDEON KUBENDRAN AMOS</b> (Assistant Professor)</p>	<p><b>Expertise (Research Interest):</b> AI-based microstructure analysis, spatio-temporal evolution of microstructure, factor analysis of alloying elements.</p> <p><b>Experience:</b> 02 yrs</p> <p><b>Publications (Journals and Conferences) :</b> 21 / 3</p> <p><b>Projects ongoing / Completed:</b> 01 / 00</p> <p><b>Total Worth of Projects :</b> 35 Lakhs</p> <p><b>PhD Completed / Ongoing :</b> -- / 01</p> <p><b>M.S Completed / Ongoing :</b> Nil</p> <p><b>M.Tech Completed / Ongoing :</b> 02 / 06</p> <p><b>Lab Established :</b> Theoretical Metallurgy Lab (Research)</p> <p><b>Addl. Responsibilities :</b> Department Data Coordinator, IIC member, Innovative Ambassador and such</p> <p><b>Notable Achievement :</b> Working Collaboration with Data Science Department of St. Joseph</p> <p><b>Worth of Facilities Established:</b> 20 Lakhs (HPC)</p>

# FACULTY PROFILES

NAME	CONTRIBUTION
 <b>Dr. NIMU CHAND REGER</b> (Assistant Professor)	<b>Expertise:</b> Heat Treatment, Polymers, Ceramics and composites <b>Experience:</b> (05 Years Teaching +03 Years Industrial Experience) <b>Publications (Journals and Conferences) :</b> 05/03 <b>M.Tech Completed / Ongoing:</b> 04 <b>Lab Established:</b> Ceramic lab
 <b>Dr. ILLA MANI PUJITHA</b> (Assistant Professor)	<b>Expertise:</b> Energy storage Batteries, Solid-State Electrolytes, Bacterial Cellulose, Carbon Materials <b>Experience:</b> 05 Months <b>Publications (Journals and Conferences) :</b> 08/ 00 <b>Notable Achievement : -</b> Recipient of Gandhian Young Technological Innovation Award 2015

# FACULTY PROFILES

Name	Contribution
 <p data-bbox="239 715 682 815"><b>Dr. ANAND S</b> <b>(Assistant Professor)</b></p>	<p data-bbox="779 305 1888 344"><b>Expertise:</b> Mathematical and Physical modelling in Extractive Metallurgy</p> <p data-bbox="779 351 1156 389"><b>Experience:</b> 5 (Industry)</p> <p data-bbox="779 396 1488 435"><b>Publications (Journals and Conferences) :</b> 10</p>
 <p data-bbox="231 1243 672 1343"><b>Dr. G. Vinothkumar</b> <b>(Assistant Professor)</b></p>	<p data-bbox="779 841 2168 879"><b>Expertise:</b> Solid-state phase transformation, Grain boundary engineering, alloy development</p> <p data-bbox="779 886 1116 925"><b>Experience:</b> 1.5 years</p> <p data-bbox="779 932 1546 971"><b>Publications (Journals and Conferences) :</b> 03/ 00</p>

# ACADEMIC ACHIEVEMENTS

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Year	No. of Publications	Citation	H-index
2018	96	1448	219
2019	171	1887	231
2020	89	1946	236
2021	74	2201	241
2022	56	2294	241

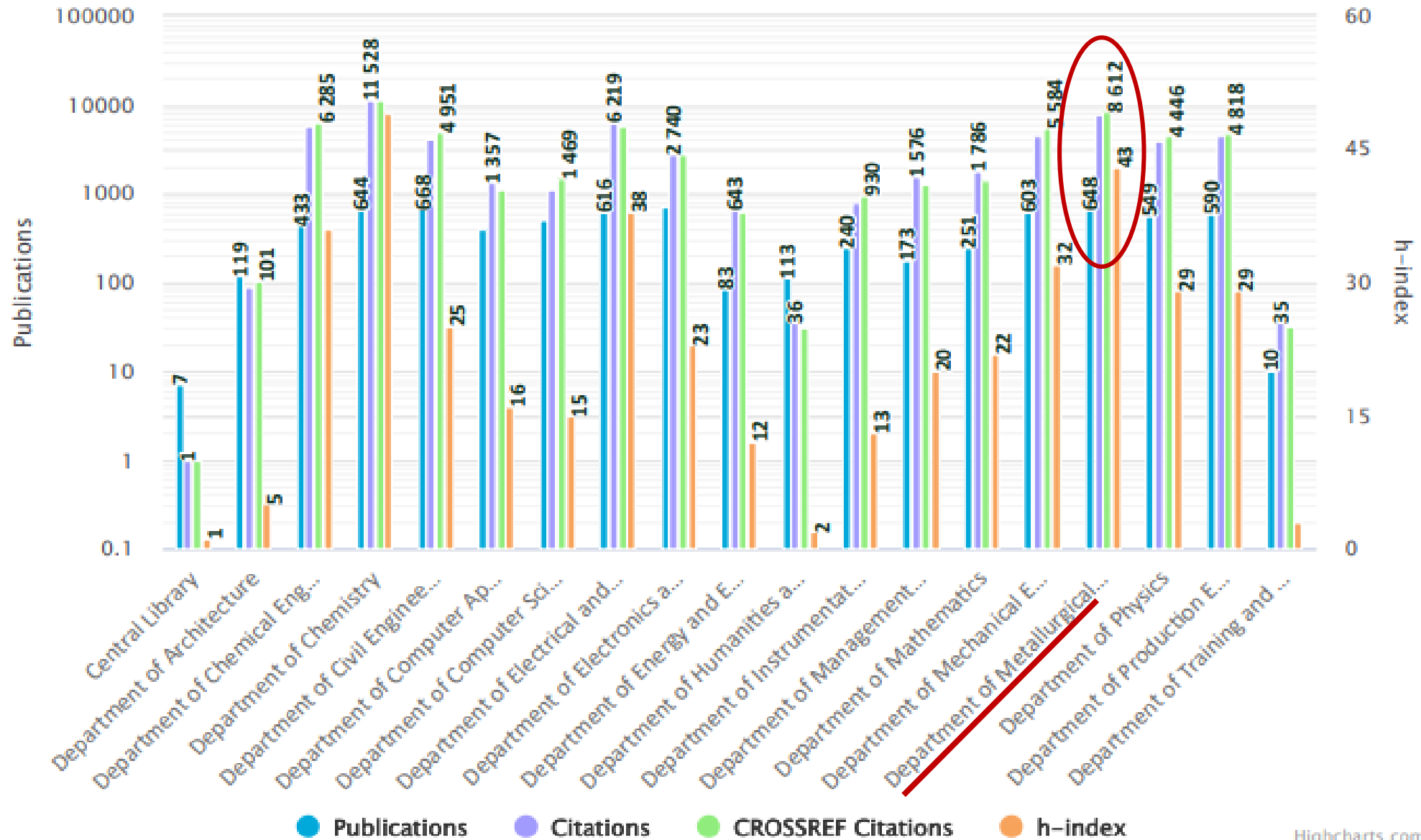
# ACADEMIC ACHIEVEMENTS (Contd...)

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- Only Engineering department in NITT published in **Nature-Scientific reports** based on the work done at NITT.
- Nucleation and growth of  $\text{TiAl}_3$  intermetallic phase in diffusion bonded Ti/Al Metal Intermetallic Laminate. **Nature – scientific reports (2018)** 8:16797, DOI:10.1038/s41598-018-35247-0
- Excellent Combination of Tensile ductility and strength due to nanotwinning and a bimodal structure in cryorolled austenitic stainless steel”, G. Venkata Sarath Kumar, K. R. Mangipudi, G. V. S. Sastry, Lalit Kumar Singh, S. Dhanasekaran & K. Sivaprasad, SCIENTIFIC REPORTS (NATURE PUBLISHING GROUP), 10, 2020, 354. [HTTPS://DOI.ORG/10.1038/S41598-019-57208-X](https://doi.org/10.1038/s41598-019-57208-x)
- Nucleation and growth of  $\text{TiAl}_3$  intermetallic phase in diffusion bonded Ti/Al Metal Intermetallic Laminate”, N. Thiyaneshwaran, K.Sivaprasad, B.Ravisankar, SCIENTIFIC REPORTS (NATURE PUBLISHING GROUP) 8, Article Number: 16797 (2018), (DOI:10.1038/s41598-018-35247-0) ISSN 2045-2322



# ACADEMIC ACHIEVEMENTS *Contd.,*



# Administrative Contribution to NIT Trichy and to other NITs

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**Prof. V. Sivan** - Director In-charge, NIT Trichy (2010)

**Prof. K.S. Pandey** - Director, MANIT Bhopal (2005-2009)

**Prof. T. Srinivasa Rao (HAG)** - Director, NIT Warangal (2011- 2016)

**Prof. S. Natarajan (HAG)** - TEQIP Nodal Officer (2009 -11) and Former Chairman CECASE., NITT

**Prof. S Raman Sankaranarayanan**, Dean Instt. Development & Alumnus Relation, NITT

**Prof. V. Muthupandi (HAG)** – Chairman, School Committee and Placement Officer, NITT

**Prof. S. Kumaran** - Warden, NITTFEST Staff Incharge (2011), ARC Member, President-TANITT

**Dr. S. Muthukumaran**, Head-IPR and Convener-Innovation Centre, NITT, Former Dean (R&C)

**Dr. S.P. Kumaresh Babu** – TEQIP Nodal Officer (2009-11) and **Chairman CECASE, NITT**

**Dr. S. Jerome** - Convener of Hostels (2012-2015) and Associate Dean (SW) (2012 -20), NITT, BoG member (2020-22), **Currently Treasurer for RECAL**

**Dr. K. Siva Prasad** - Associate Dean (R & C) (2012-15), NITT

**Dr. N. Ramesh Babu** - Associate Dean (R & C) (2015-17), Dy. Registrar (R&C), NITT (2017-20)

**Dr. D Nagarajan** - **Currently Associate Dean (P&D-Procurement)**

# NON-TEACHING STAFF

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S.No	Name	Designation
1	Mr M.Ramaiah	Senior Technical Assistant (SG II)
2	Mr M.Murugesan	Technical Assistant
3	Mr. Abhiraj R.I	Technical Assistant
4	Mr.V. Mariesan	Senior Assistant
5	Mr.KR. Azhagappan	Senior Technician
6	Mr. Dhinakaran R	Technician
7	Mr. C. Santhanaraj	Office Attendant
8	Mr.T. Boopalarajan	Apprentice
9	Mrs S.Saradha	Part time staff
10	Mrs R.Devi	Part time staff

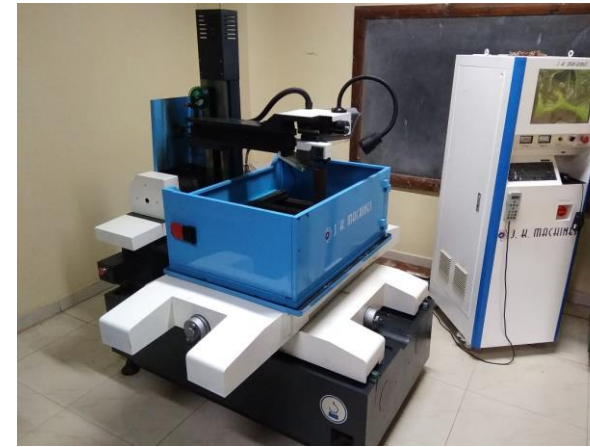
# Sponsored Research

Year	No. of Projects	Value in Rs Lakhs
2018 - 19	01	12.10
2019 - 20	02	62.26
2020 - 21	05	54.75
2021 - 22	04	153.05
2022 - 23	01	188.27

## List of **International collaborative** projects

Sl. No	External Funding Support Organization	Title of Project	Amount of Grant and Duration	PI
1	DST Indo-Czech Project	Development of high strength and low young's modulus, bioactive and antibacterial porous titanium structures for orthopaedic implants	INR 36.50 Lakhs & Oct' 20 – Oct' 23	Dr. N. Ramesh Babu
2	DST Indo-Russia Project	Development of Nanostructured Titanium Implants with Bioactive and Antibacterial Composite Coatings for Dental and Maxillofacial Applications	INR 94.30 Lakhs & July' 19 – Sept' 22	Dr. N. Ramesh Babu

# NEW FACILITIES ADDED



**WIRE CUT EDM**



**OPTICAL EMISSION SPECTROMETER**

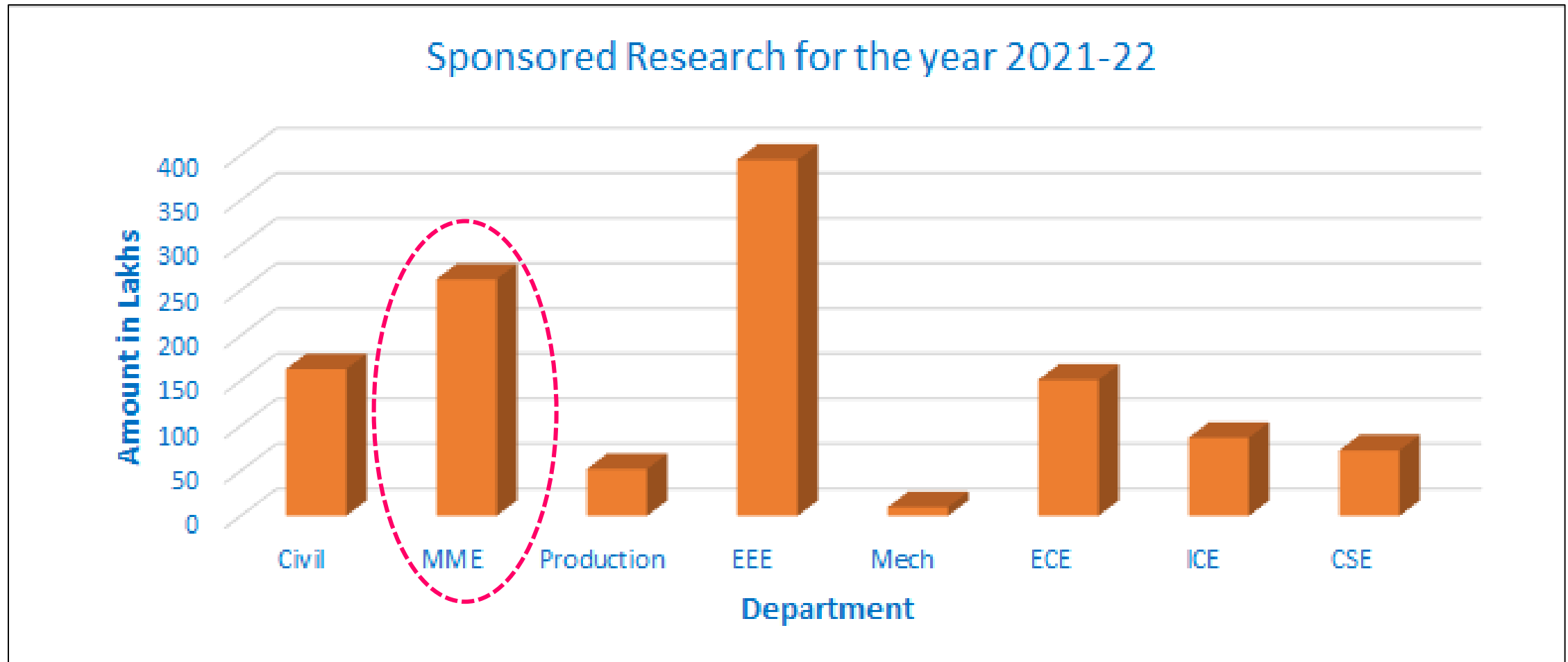


**PIN ON DISC – WEAR**



**WELDING ROBOT**

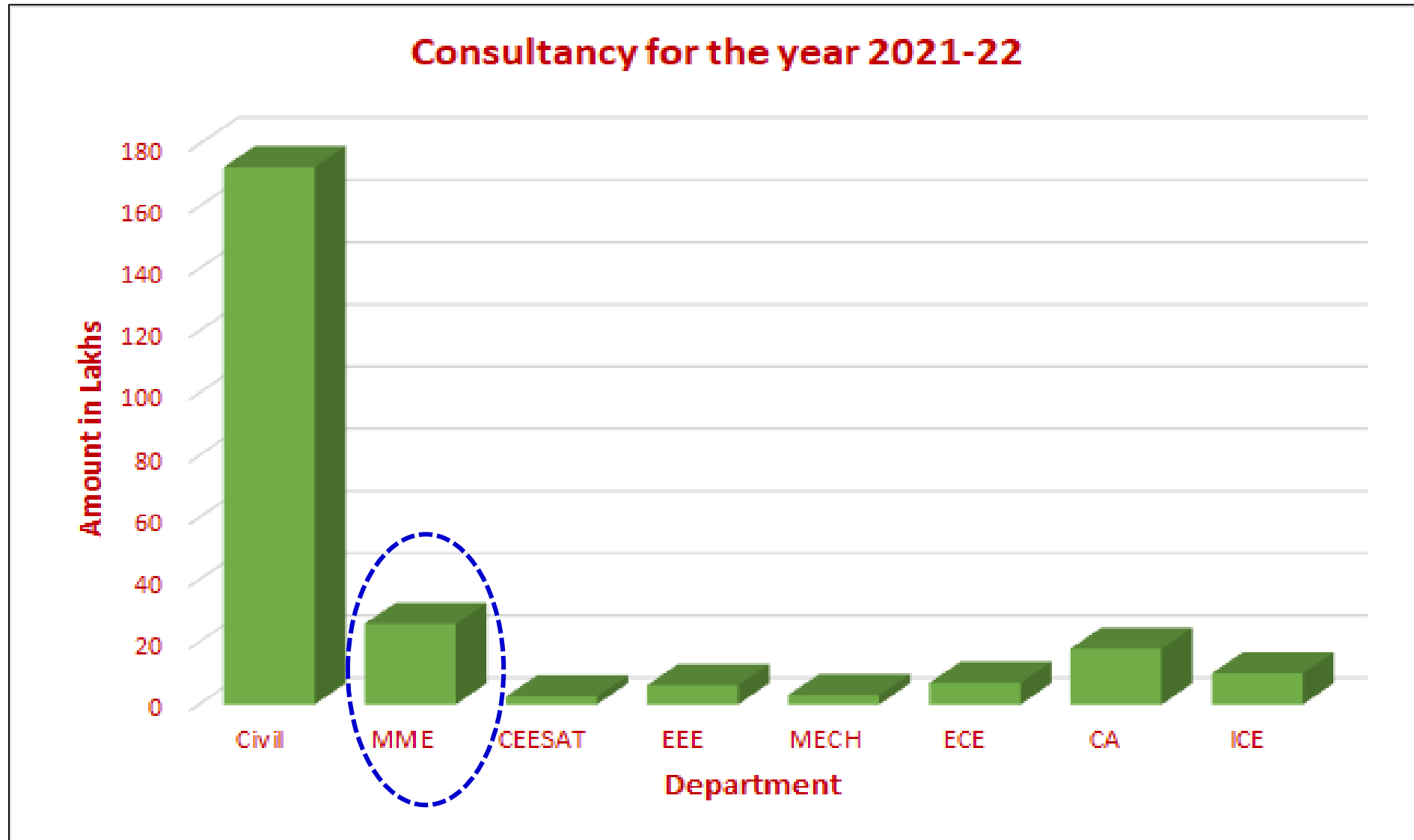
## RESEARCH PROJECTS & CONSULTANCY *Contd.,*



Project and consultancy work carried out for the Financial year 2021-22



# RESEARCH PROJECTS & CONSULTANCY *Contd.*





Honorable Minister of State in the Ministry of Education, GoI  
Dr. Subhas Sarkar eagerly watching the performance of Fureboat



# NIT-T's 'fureboat' earns kudos from Minister of State for Education

It is a cost-effective product to safeguard lives and valuables during times of floods; bamboo along with steel has been used as reinforcements to provide both strength and rigidity to the product

The Hindu Bureau  
TIRUCHI

A furniture-cum-boat, 'Fureboat' designed by a senior faculty as a cost-effective product to safeguard lives and valuables at times of floods, was appreciated by Minister of State for Education Subhas Sarkar on Monday at the National Institute of Technology - Tiruchi.

The effectiveness of the product for which a patent has been filed by the inventor S. Muthukumaran, Professor and Dean, Research and Consultancy, was demonstrated at the swimming pool in the campus.

In flood situations, boats need to be brought



Union Minister of State for Education Subhas Sarkar speaks to students at National Institute of Technology - Tiruchi on Monday.  
M. SRINATH

to the affected areas from the fishing harbours. Hence, cost-effective multipurpose device was developed to safeguard life and valuables during flood. Cot-boat and float-almirah are examples of multipur-

pose devices (furniture), Prof. Muthukumaran said.

The patent for the Fureboat filed on April 15, 2021, is titled 'Multipurpose rescue furniture and method thereof. For the Fureboat, bamboo along with steel

has been used as reinforcements/frames to provide both strength and rigidity.

A pair of oars have been fixed at the bottom of the furniture and can be readily used for rowing at times of flood. This type of furniture can be used in offices, industry, public places and houses, Prof. Muthukumaran explained to the Central Minister. He gave away the first Fureboat to the Government Middle School on the campus.

Speaking on the book 'Modi@20: Dreams meet Delivery', the Minister said the book depicted 20 years of political journey of the Prime Minister Narendra Modi- thrice as Chief Minister of Gujarat and twice as Prime Minister.



Honorable Minister of State in the Ministry of Education, GoI - Dr. Subhas Sarkar presenting the first Fureboat to a School

**Working to get certification from Shipping Corporation of India - Siemens funded Rs 3 lakhs for initiation**

# Patents, Books Published

# Dr. S. Muthukumaran

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- “Membrane for drinking water harvesting from atmospheric air”, S. Muthukumaran and G. Arthanareeswaran, Application No. 201741039055, dated 02-11-2017.
- “Self-Sealing type friction brazing / soldering of tube to tube plate using an external tool”, S. Muthukumaran and C. Maxwell Rejil, Application No. 201741038449, dated 30-10-2017.
- “Friction Welding of Tube To Tube Using a Guide Tool”, S. Muthukumaran, Application No. 201741041008 dated 16-11-2017.
- “Double Shoulder Friction Stir Processing Tool for Coating Applications”, S. Muthukumaran, 201741041009 dated 16-11-2017.

- Patent (No: 201741040346 dated: 24.11.2017. CBR NO 34881) on “INVESTIGATIONS ON MECHANICAL AND DRY SLIDING WEAR BEHAVIOUR OF ALUMINIUM HYBRID COMPOSITES” – Application Published
- Patent (No: 201941004659 A dated: 15.02.2019.) on “WEAR BEHAVIOR OF B4C REINFORCED HYBRID ALUMINUM MATRIX COMPOSITES AT ELEVATED TEMPERATURE” – Application Published in OFFICIAL JOURNAL OF THE PATENT OFFICE, ISSUE NO. 07/2019 FRIDAY DATE: 15/02/2019



## Dr. S.P. Kumaresh Babu

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- Patent Name: High Longevity Coatings and Alternate Material for Erosion and Corrosion Resistance in Mining Pumps, Register / Ref. No: 5145/CHE/2014, Organization: NITT, Date: 2014-10-01, Role: Inventor, # of Co-I: 3, Status: Filed.
- Patent Name: Corrosion Resistant Coating For Dewatering Pipes In Mining Industry Register/Ref. No.: TEMP/E-1/36139 /2017-CHE, Organization: NITT, Date: 2017-10-06, Role: Inventor, # of Co-I: 4, Status: Filed.

## As a part of IPR - Books Published

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- P.C.Angelo and **B.Ravisankar** book on “Non Ferrous Alloys: Structures, Properties and Engineering Applications”, Cengage publishers, 2018, ISBN: 9789387994041
- 
- P.C.Angelo and **B.Ravisankar** book on “Periodic Table of Elements”, Mahi Publishers, Ahmedabad, 2019, ISBN: 978-81-940137-1-6
- 
- P.C.Angelo and **B.Ravisankar** book on “Introduction to Steel- Processing, Properties and Applications”, CRC Press, Taylor & Francis Group, Florida, U.S.A. 2019, ISBN 9781138389991
- 
- T. Thirumalai, S. Nagakalyan, **B. Ravisankar** book on “Production and characterisation of aluminium with quartz in composites”, Lambert Academic Publishing, Mauritius, 2020, ISBN: 978-620-2-68457-6.
- 
- P.C.Angelo, R.Subramanian and **B.Ravisankar** book on “Powder Metallurgy; Science, Technology and Applications – 2<sup>nd</sup> edition”, PHI Learning Private Limited, 2022, ISBN: 978-93-91818-48-7.
- 
- Nivedhitha K. S., **Kumaran S.**, Nithya Chandrasekaran, “Synthesis and Electrochemical study on Nano structured Mg Based Alloy,” Lambert Academic Publishing, Germany, 2020. (ISBN: 978-620-0-22387-6)

# As a part of IPR – Book chapters Published

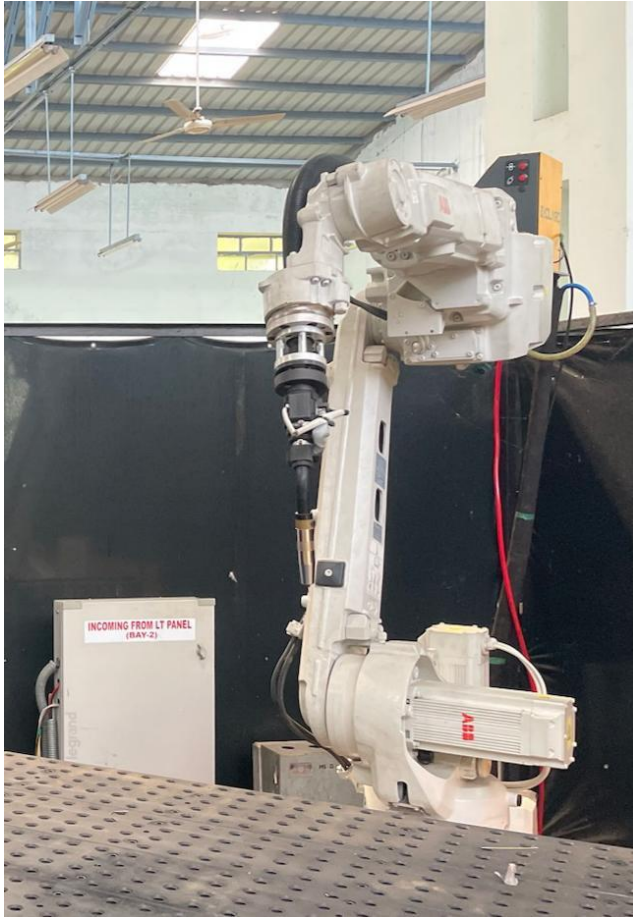
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- Yedla, N., Salman, S.A., **Karthik, V.** Molecular Dynamics Simulations for Nanoscale Insight into the Phase Transformation and Deformation Behavior of Shape-Memory Materials. In: Maurya, M.R., Sadasivuni, K.K., Cabibihan, JJ., Ahmad, S., Kazim, S. (eds) Shape Memory Composites Based on Polymers and Metals for 4D Printing. Springer, Cham. 2022, [https://doi.org/10.1007/978-3-030-94114-7\\_4](https://doi.org/10.1007/978-3-030-94114-7_4)
- G. Rajaram, **S. Kumaran, T. Srinivasa Rao** and M. Kamaraj, “High Temperature Dry Sliding Wear Behaviour of Al-Si/Graphite Composites Processed by Stir Casting, Materials Fabrication, Properties, Characterization, and Modeling”, Volume 2, 2011, 191-198, The Minerals, Metals & Materials Society (TMS), Wiley Publications. Print ISBN:9781118029466 |Online ISBN:9781118062142 |DOI:10.1002/9781118062142
- Vivekanandhan P, Murugasami.R and **Kumaran S.** “Spark plasma-assisted combustion synthesis and characterisation of nanostructured Magnesium silicide for mid-temperature energy conversion energy harvesting application”, in the book, Computational Intelligence in Materials Science, CRC Press, Tayler and Francis. UK (2021). ISBN 9780367640576 , Ist Edition.
- Book Chapter “Welding of High Entropy Alloys—Techniques, Advantages, and Applications: A Review” by R Sokkalingam, K Sivaprasad and V Muthupandi in “High Entropy Alloys: Innovations, Advances, and Applications” by T.S. Srivatsan and Manoj Gupta, 1st Edition, CRC Press (Taylor & Francis Group), 2020.

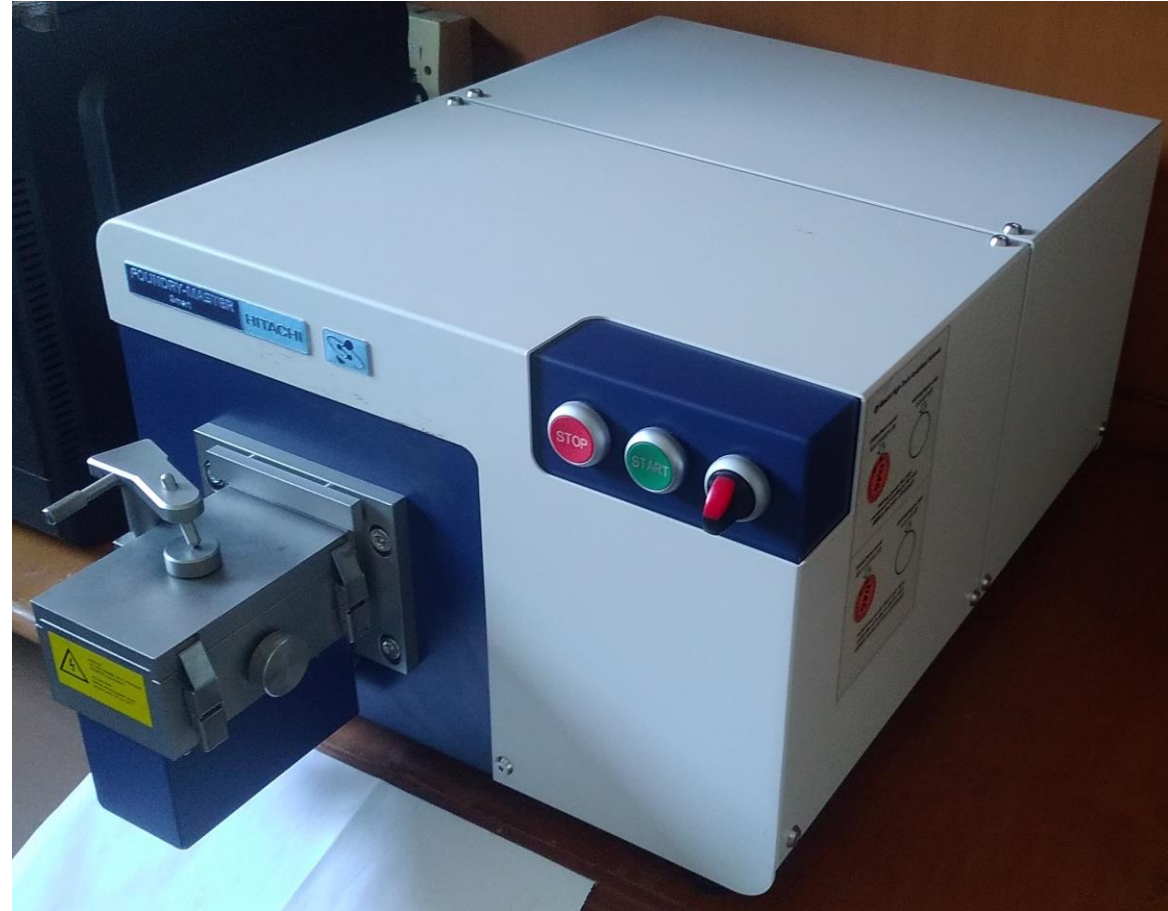
# Laboratory Facilities

# Department Laboratory Facilities

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**Welding Robot**



**Optical Emission  
Spectro**



# Department Laboratory Facilities

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**SEM with EDS**



**X-ray  
Diffraction**



# Department Laboratory Facilities

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Spark plasma sintering Machine



Seebeck coefficient and electrical resistance system

*Contd.,*

# Department Laboratory Facilities

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**High energy planetary Ball  
Mills**

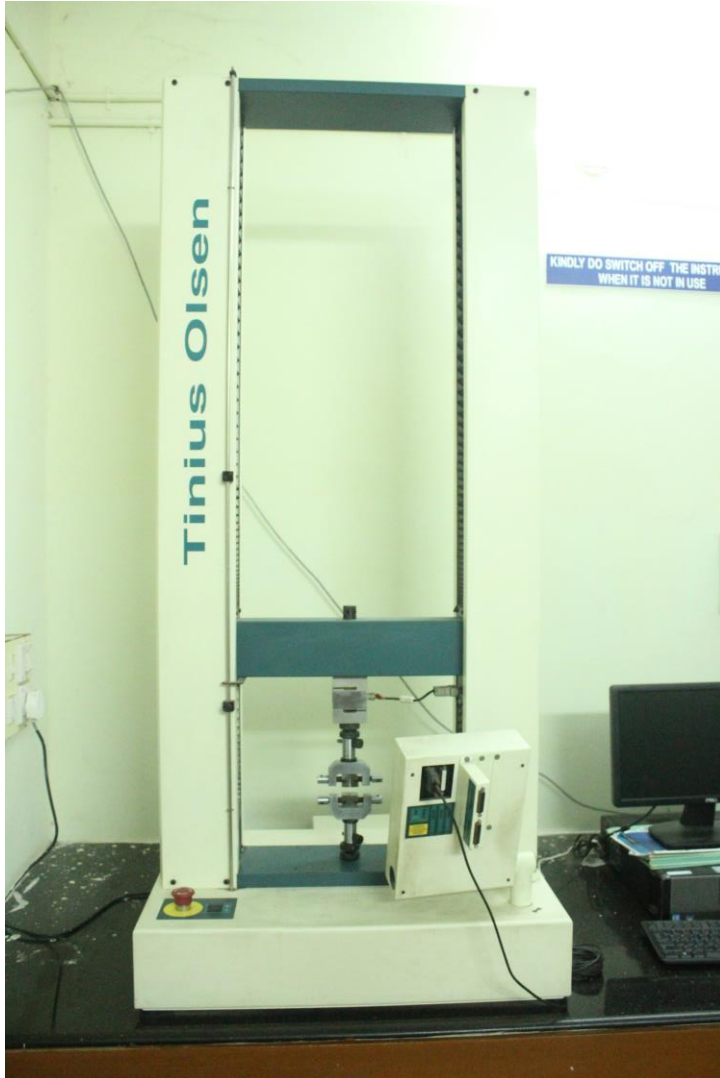


***Contd.,***



# Department Laboratory Facilities

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**Micro Tensile / compression Instrument  
(Cold/ hot / Cryo atmosphere)**

**Contd.,**

# Department Laboratory Facilities

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**Hydraulic Press**



# Department Laboratory Facilities

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**Polymer and Composite Laboratory**

# Department Laboratory Facilities

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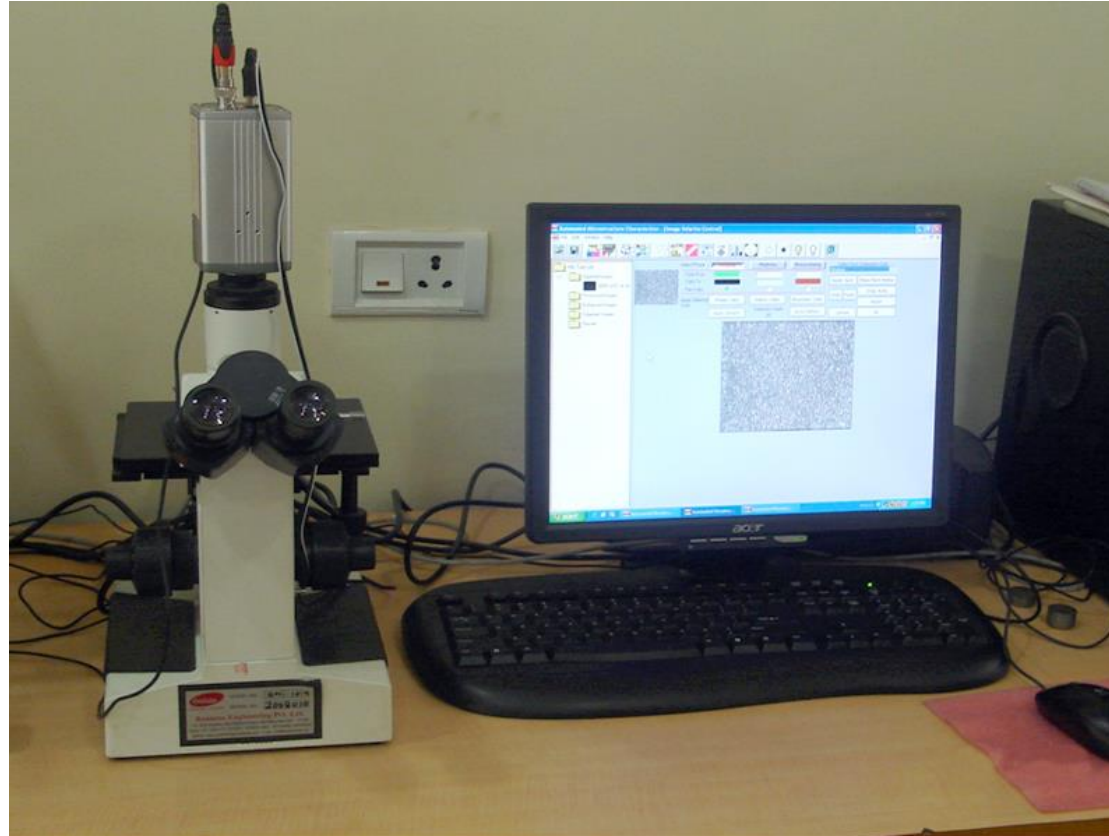
Diffusion Bonding Instrument

*Contd.,*



# Department Laboratory Facilities

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**Metallography / Microscopy**

***Contd.,***

# Department Laboratory Facilities

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**Mechanical Testing LAB**

*Contd.,*

# Department Laboratory Facilities

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**Advanced Materials Processing Lab**

***Contd.,***



# Department Laboratory Facilities

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**Process Metallurgy LAB – the “youngest!” And the “oldest”**

***Contd.,***

# Department Laboratory Facilities

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Melting Furnaces



*Contd.,*

# Department Laboratory Facilities

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## Vacuum Induction Melting Furnace laboratory trials to develop exotic species (materials)



*Contd.,*



# Department Laboratory Facilities

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**Friction Stir Welding** – metallurgists working to bring together different materials!



*Contd.,*

# Department Laboratory Facilities

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CMT & Micro Plasma Welding unit



*Contd.,*

# Department Laboratory Facilities

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**Optical Profilometer**



**Scratch Tester**

***Contd.,***



# Department Laboratory Facilities

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**Cyclic Corrosion Chamber**



**Micro Hardness Tester**

***Contd.,***



# Department Laboratory Facilities

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**Thermal Analyzer**



**FTIR Spectroscopy**

# Summer Internship

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Our students in every year secure prestigious summer internships in abroad

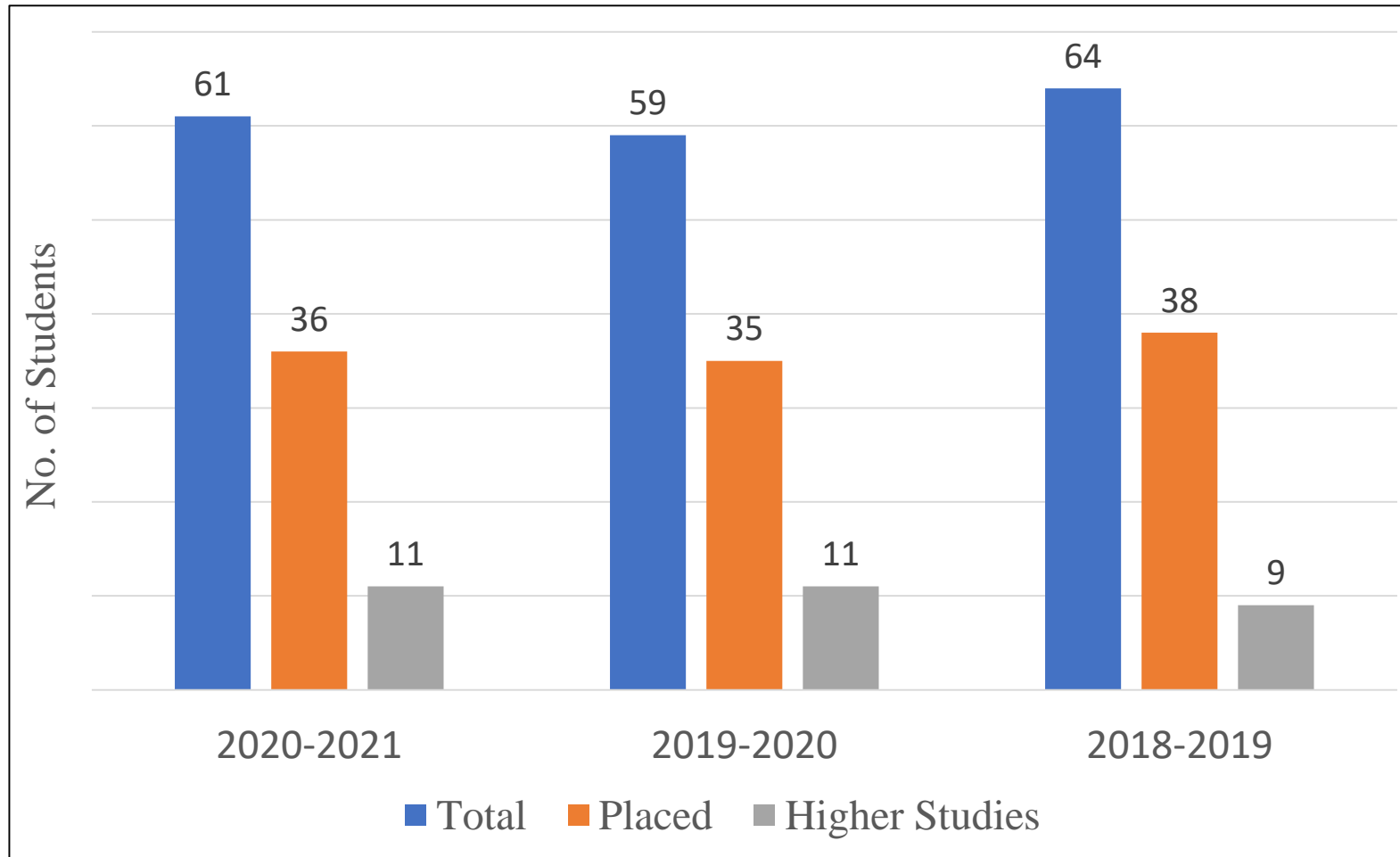
MITACS , Canada

DAAD, Germany

Charpak, France

NUS, Singapore

# Placement and Higher Studies



Avg. Placement Index: **0.76**

**GATE achievement**

D Laxman Rao – **AIR 1**-2021

Madhav – **AIR 14** - 2019



The Top 10 scholars (in no particular order) of the WOM scholarship programme are mentioned below:

- Adrija Nag, NIT Jamshedpur
- Ananya Kant, BIT Mesra
- Anoushka Pal, IIT BHU
- Ativa Rath, VSSUT
- Devi Janani Ramesh, NIT Trichy
- Kirty Goyal, CET, Bhubaneswar
- Poorvi Agrawal, NIT Raipur
- Riya Mehta, NIT Jamshedpur
- Shrutika, NIT Jamshedpur
- Yavnika Chauhan, IIT BHU



# New building

- The foundation stone was laid on 25/09/2021 for new building for MME worth of approximately Rs. 30 crores

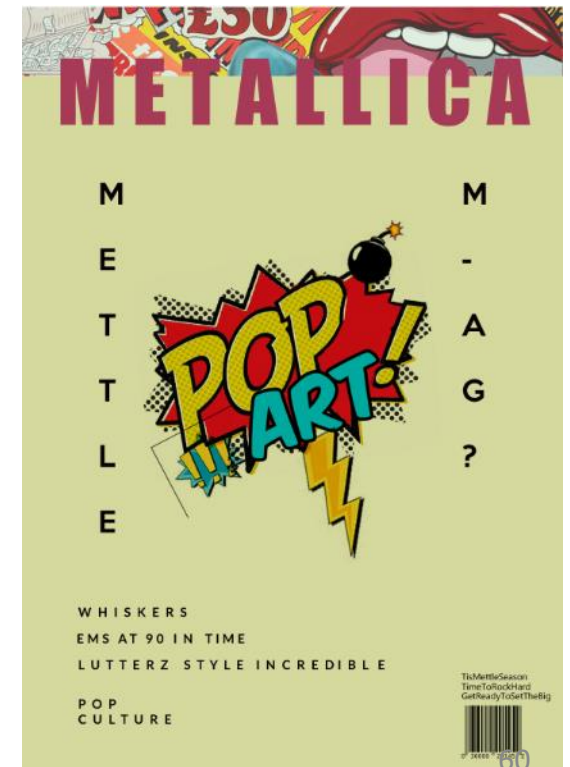


# Elevation of Proposed new building

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# Students Publications – Newsletter (MMEA)






# Professional Activities (MMEA)

**MMEA Presents**

**AURUM**  
Guest Lecture Series



**Prof. B. S. Murty**  
Director, IIT-Hyderabad

**Topic**  
**The exciting world at the bottom:  
Probing materials at small scale**

- Prof. B. S. Murty has pioneered the field of non-equilibrium processing of materials by mechanical alloying and high entropy alloys.
- He graduated from IIT Bombay with degrees in Metallurgy and Materials Science respectively.
- He has immensely contributed to the development of bulk metallic glasses, and Al based composite materials.
- He is the recipient of Shri Bhatnagar Award and J. C. Bose Award. He has been selected as a distinguished alumnus of IIT Bombay.

Check out the lecture series @ Mettle NIT T

**METTLE'22**  
presents

**AURUM**  
Guest Lecture Series

**SKYRMIONS**  
A New Era in **Ferroelectrics**



**Prof. Ramamoorthy Ramesh**  
Purnendu Chatterjee Chair  
Department of Physics & Department of Materials Science & Engineering,  
Materials Sciences Division,  
Lawrence Berkeley National Laboratory,  
University of California, Berkeley

Date: **19<sup>th</sup> November**  
Time: **8:30 AM**  
Platform: **MS Teams**

**Supraja**  
+91 94439 38925

**CONTACTS**

**Harish**  
+91 77089 30625

**MMEA presents**

**AURUM**  
GUEST LECTURE SERIES



**Prof. YURY GOGOTSI**  
Distinguished University Professor and Charles T. and Ruth M. Bach Professor of Materials Science and Engineering at Drexel University.  
Director, A.J. Drexel Nanomaterials Institute

**TOPIC**  
MXenes - 2D Carbides and Nitrides of Transition Metals

**DATE**  
OCTOBER 7<sup>TH</sup>

**TIME**  
7:00 PM, IST

**PLATFORM** MS TEAMS

**TOPIC**  
CALPHAD-BASED METALLURGICAL DESIGN  
FOR ALLOY MANUFACTURING AND BEYOND



**DR. WEI XIONG**  
DIRECTOR OF PHYSICAL METALLURGY  
AND  
MATERIALS DESIGN LAB,  
UNIVERSITY OF PITTSBURGH




SCAN TO JOIN

61



# Professional Activities (Material Advantage)



**MATERIAL ADVANTAGE**  
NATIONAL INSTITUTE OF TECHNOLOGY TRICHY PRESENTS

**SIR ALAN COTTRELL MEMORIAL  
GUEST LECTURE SERIES**

**DR. GEORGE VANDER VOORT**  
Pioneer in Metallography  
Consultant - Buehler

**Topic : Basics of Metallography**

29<sup>th</sup> DECEMBER 2020 | 9:00 PM IST



**MATERIAL ADVANTAGE**  
NATIONAL INSTITUTE OF TECHNOLOGY TRICHY PRESENTS

**SIR ALAN COTTRELL MEMORIAL  
GUEST LECTURE SERIES**

**DR. ERIC SCHINDELHOLZ**  
Asst. Professor,  
Fontana Corrosion Center (The Ohio State University)  
Former Senior Researcher,  
Sandia National Laboratory.

**Topic : New Frontiers in Corrosion of Structural Materials**

20<sup>th</sup> NOVEMBER 2020 | 8:00 PM



**MATERIAL ADVANTAGE**  
NATIONAL INSTITUTE OF TECHNOLOGY TRICHY PRESENTS

**SIR ALAN COTTRELL MEMORIAL  
GUEST LECTURE SERIES**

**DIERK RAABE**  
Director, Department Microstructure Physics and Alloy Design,  
Physical Metallurgy of Sustainable Alloys,  
Max Planck Institute for Iron Research

**TOPIC: SUSTAINABLE METALLURGY**

Date: 14 June 2021 Time: 2:00 PM

Archita V 9791122313



**MATERIAL ADVANTAGE**  
The Student Program for Materials Science and Engineering

**2021**

**GET SET GALVANISE!**  
Join the 3 day Orientation Trivia Madness with Material Advantage, NIT Trichy  
Round 1 : Robus  
Round 2 : Materials Match  
Round 3 : Who's that element?  
Round 4 : Crossword  
Round 5 : Extract the metal  
Win Cash Prizes upto ₹800  
Event Dates : 18th to 24th October 2021 Event Time : 6:00 PM IST

**SIR ALAN COTTRELL MEMORIAL Guest Lecture Series**  
DR. ALPHONS A. ANTONYSAMY  
SNT Aerospace, UK  
Principal Materials Engineer  
Date: 27 August 2021 Time: 4:00 PM IST Archita V 9791122313

**DIRECTIONS: Alumni Guest Lecture Series**  
Sreenivas Raguraman  
PCL Student, Health Strategy, Jorhat Medical University  
Date: 20th May 2021 Time: 7:30 to 9:30 PM Archita V 9791122313

**SIR ALAN COTTRELL MEMORIAL Guest Lecture Series**  
DR. SAI GAUTAM GOPALAKRISHNAN  
Principal Researcher, SAMAT Group, IISc  
Date: 18<sup>th</sup> September 2021 Time: 11:00 AM IST Archita V 9791122313

**DIRECTIONS: Alumni Guest Lecture Series**  
MEGHNA NARAYANAN  
MS Research Scholar, IIT Madras  
Date: 24 July 2021 Time: 6:00 PM Archita V 9791122313

**SIR ALAN COTTRELL MEMORIAL GUEST LECTURE SERIES**  
DIERK RAABE  
Director, Department Microstructure Physics and Alloy Design,  
Physical Metallurgy of Sustainable Alloys,  
Max Planck Institute for Iron Research  
**TOPIC: SUSTAINABLE METALLURGY**  
Date: 14 June 2021 Time: 2:00 PM Archita V 9791122313



# Students' Achievements



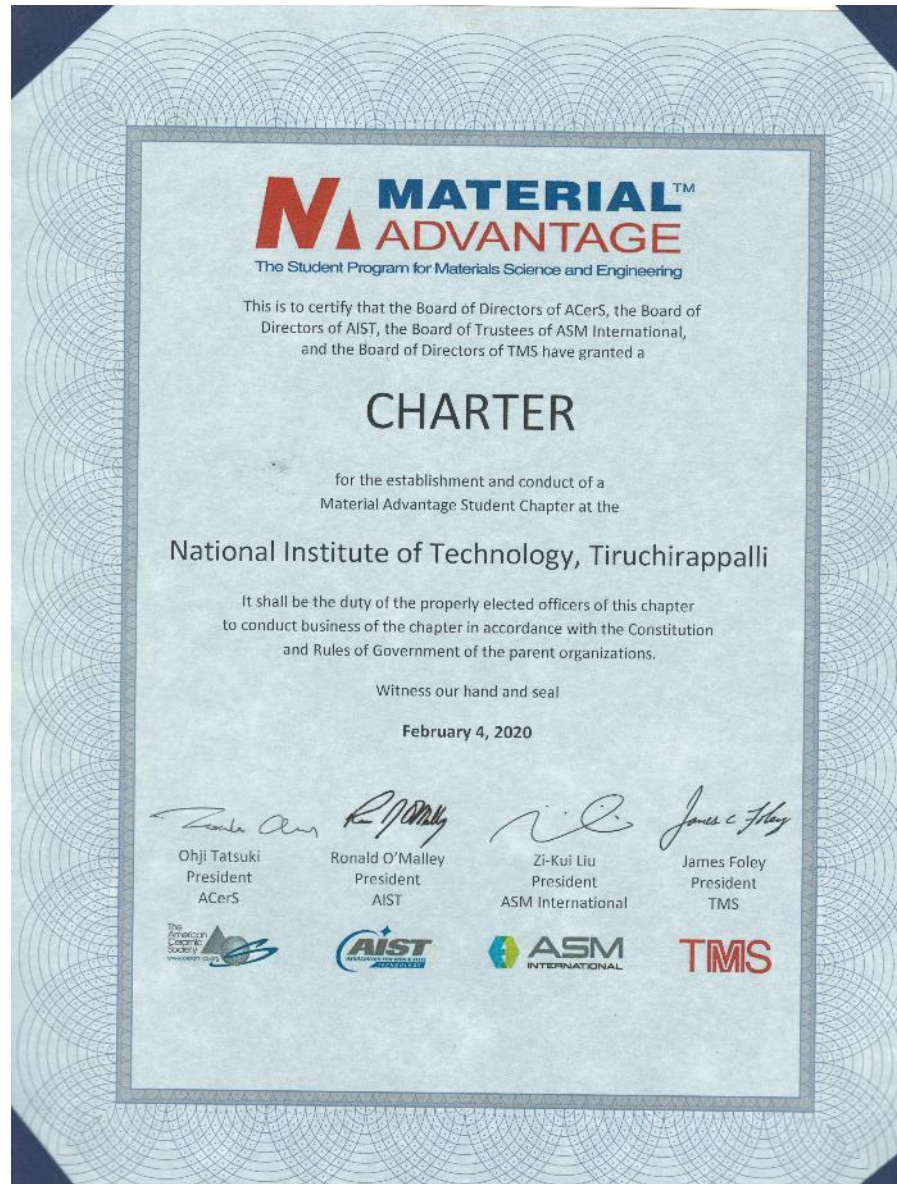
**Mr. K. Akshay (112116026)**  
**Manager –Operations, Tata Steel**

**SURYARAO KIMAYA (112118058)**

**MIT DMSE SM**



# Material Advantage Student Chapter



**Thank You**