# Advanced Research Institute

## 1 About ARI

- Dedicated Research Wing of the University
- Started in the year 2011
- Research & Development
- Training
- Consultancy
- Extension Activities

Related to

- Strategic domains
- Socially Important domains

Towards

- Nation Building
- Improving Human Development

**Founding Principles**

- Possible to build a World Class Research Institute even in Private, when we rely on people and their brain power rather than on expensive research infrastructure.
- Possible to attract smart people for Research (including professionals returning from abroad), when a liberal and decent ambience is provided.

**Our Values**

- Professionalism with Compassion
- Dedication to Target
- Freedom to Explore

## 2 Vision

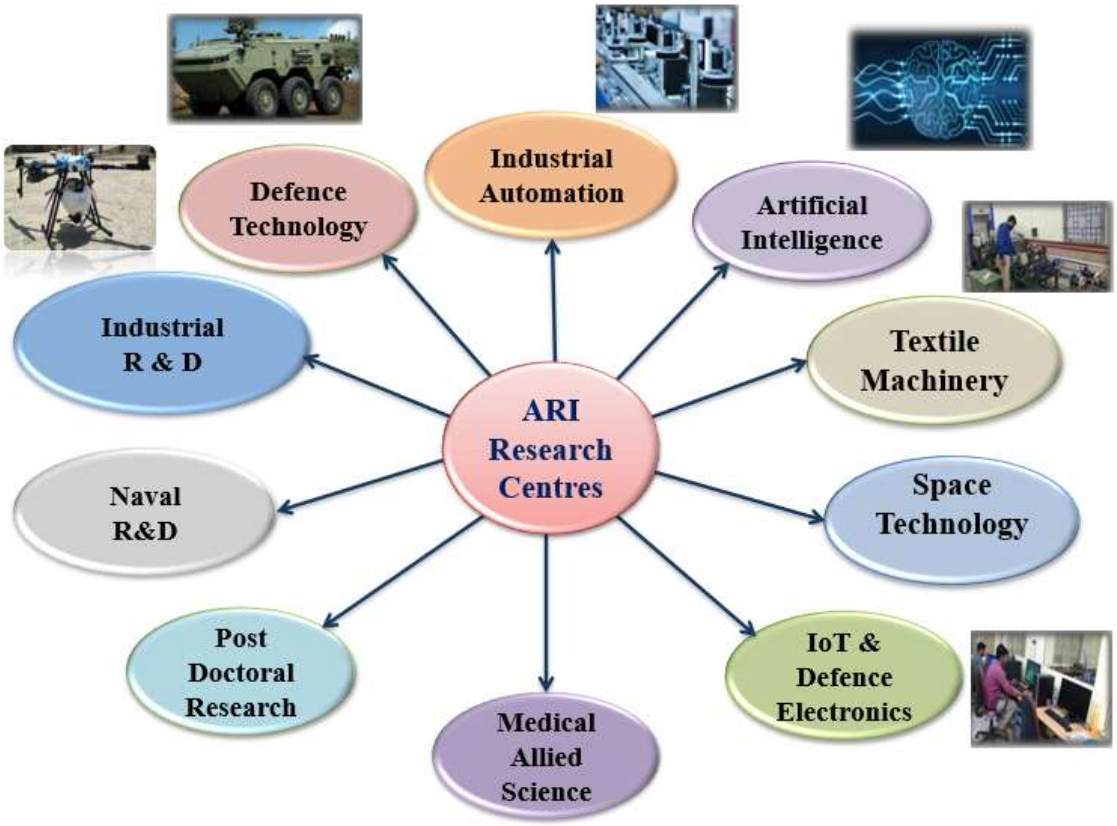
- "World class Research, Development and training"

## 3 Mission

"Knowledge Creation and Nation Building by Break Through Research to Solve Challenging Problems"

1. Knowledge Creation
   - IPR generation and sectoral growth in strategic domains (Defence, Space, Energy, Food) & Societal Domains (Textiles, Medical, Agriculture, Engineering Industries)
2. Serving the Nation through
   - High quality collaborative research
   - Transformational Research leading to process technology development
   - Intellectual Property Rights
   - Publications

## 4 Research Centers




## 5 Common Facilities

5.1 Design Centre

5.2 Knowledge Centre

5.3 Engineering Workshop

5.4 Electronic Workshop

5.5 IPR Facilitation

5.6 Start-Up-Facilitation

# 6 Research Centers

## 6.1 DEFENCE R&D

**Centre Name : Defence R & D Centre**

**Centre Head Name : Er. D. Pandurengan**

| Parameter | Info for the Centre |
|---|---|
| Vision | "To be a Centre for the Design and Development of Defence Application" |
| Mission | "Design, Develop, Integrate and Lead to production of Defence applications."<br>"Development of technologies for Naval, Army and Machine design of research for the specific application." |
| Innovation | • Indigenous Underwater vehicle for Naval surveillance application.<br>• Bio-mimic robotic underwater fish.<br>• Indigenisation of CRDi fuel injection system for Armoured Fighting Vehicle.<br>• SPM design for Coir yarn spinning process. |
| Extra Ordinary Achievements | • Singapore AUV 2022 selected held all over world.<br>• Indigenous Design of CRDi fuel injection system for AFV Engine<br>• DRDO-NSTL funded project on Poly-renewable energy for ASV.<br>• Collaboration project with IIT Indore for Bio-mimic robotic fish. |
| Patents | • Underwater switch.<br>• Rapier loom conversion kit<br>• Shearing Machine for coir yarn<br>• Yarn doubling Machine for coir yarn. |
| Publications | "Renewable Energy powered Autonomous Smart Ocean Surface Vehicles (REASOSE)". In International Journal of Integrated Engineering |
| Proposals | ISRO- NRSC Low cost ROV Surface vehicle for bathymetry survey.<br>ISRO- Laser NDT evaluation for welding strength<br>ISRO- Chemical solution for removal and quantification of oil contaminants in Semi-cryo engine<br>DST- Design and development of AUV with buoyancy engine control.<br>DST- Design and Development of Agricultural robot for seed sowing<br>IDEX- 11 m electric boat<br>IDEX- Track Tensioner for BMP II Vehicle<br>IDEX- Rubberised Track Pad for BMP II Vehicle |
| MoUs | GRP Industries (Madras) for AUV, ASV Composite development |
| Project Reports | CRDi- CVRDE DRDO Project Report<br>Bio-mimic Robotic fish project IIT Indore Project. |
| Start Ups | DR MGR ARI NAVAL & AEROSPACE INNOVATION LLP |

## 6.2 TEXTILE MACHINERY

**Centre Name : Textile Machinery Invention Centre (TMIC)**
**Centre Head Name : Prof. Dr. V. Natarajan**

| Parameter | Info for the Centre |
|---|---|
| **1. Vision** | To make Textile Machinery Invention Centre (TMIC) as one of the Pioneer Research Centres for Textile Engineering Research India |
| **2. Mission** | To contribute to Nation building thro' world class research resulting in:<br>➢ Break-through technologies in Textile materials, Processes & Machinery<br>➢ Patents & Publications of International standard<br>➢ Scientific training of Research Scholars for innovative and original research<br>➢ Effective Transfer of Technologies and Commercialisation Research Output |
| **3. Innovation** | Research on Break-through Research Problems |
| **4. Extra Ordinary Achievements** | Development of New Coir spinning machine<br>1 Patent filed in India & 5 Foreign Countries for new class of Coir spinning machine |
| **5. Patents** | 4 Patents on Coir spinning machine (1 Patent Granted)<br>2 Patents on Preparatory machines for Coir spinning<br>2 patents on post-spinning machines for coir<br>2 Patents on Coir Fiber Extraction<br>2 patents on improved cotton spinning machine<br>1 patent on Coconut leaflet geo-textile fabric |
| **6. Publications** | 1 paper ready for submission |
| **7. Proposals** | 1 Proposal on Coconut leaflet geo-textiles<br>1 proposal on new Cotton spinning system |
| **8. MoUs** | Technical University of Liberec, Liberec (Czech Republic)<br>Faculty of Mechanical Engineering<br>(Dept. of Textile Machine Building) |
| **9. Project Reports** | Report on Coir yarn spinning – Development of New Class of Plant machinery for Modern coir yarn spinning mills |
| **10. Start Ups** | 1 Start-up – Dr. MGR-ARI Modern Coir Mill Machinery LLP |

## 6.3 SPACE TECHNOLOGY

Centre Name : Space Technology
Centre Head Name : Dr. G Moorthy

| Parameter | Info for the Centre |
|---|---|
| **1. Vision** | To be a Versatile Research Centre for Space Technology |
| **2. Mission** | • Research in leading edge Technology & Engineering<br>• Providing computational solution with technology transfer<br>• Problem solving & new product development |
| **3. Extra Ordinary Achievements** | POC for control system (Ball on a Beam)<br><br>3d printing structure for models and working product |
| **4. Patents** | • Development of 3d printer from 3d printed parts<br>• Development of3d printer filament by re-cycling pet bottles<br>• Solar tree as a basic amenity |
| **5. Publications** | • Depth Of Penetration (DOP) of Bullet – Confirmed for publication<br>• Electro Mechanical Actuator (EMA) – Under review<br>• Holographic Bond Test – Under review |
| **6. Proposals** | • High cycle fatigue analysis (ISRO)<br>• High cycle fatigue analysis (DST - SERB)<br>• Electro Mechanical Actuator (ADE) |
| **7. Workshops Organized** | • 3d printing Hands on Training for Mechanical Engineering students.<br>• 4 days' Work Shop on 3d printing, design for 3d printing and 3d printing technology transfer |

## 6.4 IOT

**Centre Name : ARI-IoT & Defence Electronics Research Centre**
**Centre Head Name : Er. M. Hariram Chandar**

<table>
<tr><th>Parameter</th><th colspan="4">Info for the Centre</th></tr>
<tr><td>1. Vision</td><td colspan="4">Enriching life through IoT research.</td></tr>
<tr><td>2. Mission</td><td colspan="4">• Solving people’s problems through Innovation<br>• Educating Society with innovation<br>• Engineering smart IoT Products</td></tr>
<tr><td>3. Innovation</td><td colspan="4">• Smart Switch with universal access.<br>• Touchless hygienic Dustbin.<br>• Educating science in a fun and interesting way.</td></tr>
<tr><td>4. Extra Ordinary Achievements</td><td colspan="4">• Engineered 3d Printer on our own.<br>• Engineered customizable smart switch.</td></tr>
<tr><td rowspan="5">5. Patents</td><td>#</td><td>Title</td><td>No</td><td>Status/Year</td></tr>
<tr><td>1.</td><td>Smart Switch</td><td>E-2/650/2022/CHE</td><td>Completed</td></tr>
<tr><td>2.</td><td>Fuel Theft alert System</td><td></td><td></td></tr>
<tr><td>3.</td><td>Smart Podium Mic</td><td></td><td></td></tr>
<tr><td>4.</td><td>Smart head Phone</td><td></td><td></td></tr>
<tr><td>6. Proposals</td><td colspan="4">• Aavin industrial automation<br>• Bulletproof helmet<br>• Smart lock<br>• Robotic vacuum cleaner<br>• Power line monitoring<br>• Robotic Dustbin<br>• Smart parking<br>• 3 d Print<br>• Smart solar<br>• Fuel theft</td></tr>
<tr><td>7. MoUs</td><td colspan="4">• Marketing collaboration with Hackberry automation and Robotics<br>• Science Express YouTube collaboration<br>• Smart solar consultancy project<br>• Smart home consultancy project</td></tr>
<tr><td>8. Project Reports</td><td colspan="2">• Smart Switch<br>• Power Line Monitoring<br>• Robotic Dustbin<br>• Fuel theft Alert system<br>• 3D Printer<br>• Sweeping Robot</td><td colspan="2">• Automatic Parking<br>• Smart solar<br>• Smart Door<br>• Smart kitchen<br>• Smart Lock<br>• Milk Dispenser</td></tr>
<tr><td>9. Start Ups</td><td colspan="4">• Hackberry Automation and Robotics<br>• Science express</td></tr>
<tr><td>10. Workshops Organized</td><td colspan="4">• Marketing workshop hackberry<br>• Editing workshop science express<br>• Rework station for IoT<br>• Coding Workstation for IoT<br>• IoT Centre of Excellence</td></tr>
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## 6.5 AI & AEROSPACE

**Centre Name:** Centre of Artificial Intelligence & UAV Lab

**Centre Head Name:** Er. M. Kamala Hasan

| Parameter | Info for the Centre |
|---|---|
| **1. Vision** | Human Centreed Automation |
| **2. Mission** | a) Design and Automation to meet sustainable and agile needs of Industrial sector.<br>b) Embedding Big-Data intelligence for digital solutions. |
| **3. Innovation** | a) Feasibility study & Development of a Self-Sustainable Dual Renewable Energy Harvesting System for unmanned / autonomous Ocean Surface Vehicle<br>b) Feasibility study of implementing swarm intelligence for an indigenous underwater vehicle<br>c) Design & Development of Bio-mimic Robotic Fish<br>d) UAV<br>e) Air pollution monitoring<br>f) Soil<br>g) Boat |
| **4. Extra Ordinary Achievements** | a) Embedded system,<br>b) Wireless Communication,<br>c) Artificial Intelligence,<br>d) Internet of Things |
| **5. Patents** | **a)** Low Cost Smart Monitoring and Controlling Board with 5g Technologies **(Application Number – 201841019568).**<br>**b)** Compact Multiband Inset Feed Micro Strip Patch Antenna **(Application Number - 201841024524).**<br>c) Advanced Women Safety and Defending Combinational Device **(Application Number – 201841024527).**<br>d) Portable air pollution monitoring device for ambient air quality assessment using IOT and GIS Technology **(Application Number- 201941023458).**<br>e) Design and fabrication of self-governing submerged vehicles for ocean and underwater sampling **(Application Number - 201941023457).**<br>f) Design and Development of a Smart Agro Device **(Application number – 202041007475).** |
| **a) Publications** | a) S Gayathri., B Swapna.,S Balavinoth., **M Kamalahasan** (2020), "Retire away Essential Accuracy for Darkness Discovery and Elimination", Test Engineering and Management, Vol. 83, no. , pp.2411-2417.<br>b) **Kamalahasan M**., Kamaleshwari C S A., (2020), "Phase Measurement Analysis in Field Programmable Gate Array (FPGA)", Test Engineering and Management, Vol. 82, no. , pp.14225-14230<br>c) **M Kamalahasan**., S Sowmiya., S Srinidhi., S Vasanth., (2020), "Digital picture watermarking technique for security applications", IOP Conference Series: Materials Science and Engineering, Vol. 872, no. 1, pp.1-8.<br>d) S Gayathri., **M Kamalahasan**., H Hemasundari., M Siraasganth., S Ranjith (2020), "E-healthcare monitoring using internet of things", IOP Conference Series: Materials Science and Engineering, Vol. 872, no. , pp.1-6.<br>e) **M Kamalahasan**., Rishi Mishra., Dipankar singh., Adnan umar mallick (2020), "Secure Fault Diagnosis for Framework on Chip Design and Testing", International Journal of Innovative Technology and Exploring Engineering, Vol. 9, no. 5, pp.715-720.<br>f) **Kamalahasan M**., B Swapna (2019), "Decent Transmission of Visible Light Communication Info through Light Fidelity", International Journal for Research in Applied Science and Engineering Technology, Vol. 7, no. 11, pp.119-122.<br>g) B Swapna., **M Kamalahsan**., S Sowmiya., Srilekha Konda., T Saizignasa (2019), "Design of smart garbage landfill monitoring system using Internet of Things", IOP Conference Series: Materials Science and Engineering, Vol. 561, no., pp.1-6. |

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| | h) **M Kamalahasan**, S Gayathri(2020), "AI Powered Face Recognition Based Attendance Marking System", Journal of Advanced Research in Dynamical and Control System, vol 12, pp.1607-1611. |
| **a) Proposals** | |
| **b) MoUs** | a) MOTES Engineering Solution<br>b) MPAGS e-Systems & Innovative Solutions Private Limited<br>c) PYCHYSIGNALS Pvt. Ltd. |
| **c) Start Ups** | Applied for approval (In process) |
| Workshops Organised | WORKSHOP:<br>1. 2017 at Anna University, Chennai.<br>2. Attended two-day workshop "RC Quad copter" by IEEE student branch, VIT Chennai. 23-24 March 2018.<br>3. Attended IETE Sponsored two days National Level Workshop "Art of writing a Report, Research Paper and Thesis", 13-14 August 2018 at Sri Ramakrishna Engineering College, Coimbatore1. Attended simulation workshop titled "Marine Autonomous Underwater Vehicle Design" by AROBOT, Chennai and Robotics & Automation Society, IEEE Madras on 22nd December.<br><br>TRAINING PROGRAMME:<br>Attended International Training Course on "Small Satellite Mission" organized by CSSTEAP and Indian Institute of Remote Sensing, Dehradun and ISRO, Bangalore during 26 November to 7 December 2018 at Dehradun.<br>Completed special course on "Machine Learning and Its's Application" conducted by the IIRS during June 03-07, 2019.<br>Completed training on "Assembling, Programming and Flying of autonomous UAV". Conducted by AFI technology, Coimbatore, TamilNadu, India held on 25th, 26th & 27th November 2019. |

## 6.6 AUTOMATION

**Centre Name:** Industrial Automation

**Centre Head Name:** Mr. R. Sankar

| Parameter | Info for the Centre |
|---|---|
| **Vision** | Human Centreed Automation |
| **Mission** | Design and Automation to meet sustainable and agile needs of Industrial sector.<br>Embedding Big-Data intelligence for digital solutions. |
| **Innovation** | Portable Tensile Tester<br>Portable Needle Felting |
| **Extra Ordinary Achievements** | IPR Facilitation & Progress (15 patents filed in short span of 6 months).<br>Meeting with Wg. Cdr. Mr. Soma, founder of PYCHYSIGNALS at ARTPARK (IISc, Bangaluru).<br>Machine Erection & Training at CCRI, Kerala. |
| **Patents** | Method of making Panchagavya and Panchagavya making Machine (Ref.no. 202241014210, DST-SERB under Evaluation Ref.no. 182022005917).<br>Method of harvesting Groundnut and Groundnut Harvesting Machine (Ref.no. 202241015354, DST-SERB under Evaluation Ref.no. 182021002804). |
| Proposals | Submitted and under evaluation:<br>Tamil Nadu State Council for Science & Technology<br>Panchagavya making Machine<br>Groundnut Harvesting Machine<br>DST/SERB/Core Research Grant<br>Design and Fabrication of Panchagavya making Machine (Ref.no. 182022005917).<br>Design and Development of Portable Electric Groundnut Harvesting Machine (Ref.no. 182021002804).<br>Integrated Coconut Grade Segregation, Edge Cutting and De-Husking Equipment (Ref.no. 182022006161).<br>ISRO 2022<br>Influence of inclusions, material in-homogeneities and voids in the macroscopic behavior of metals for aerospace applications (RES-VSSC-2022-012).<br>Development of active learning algorithm for human in loop AI system for satellite imagery analysis (RES_SAC-2022-021). |
| **MoUs** | MOTES Engineering Solution<br>MPAGS e-Systems & Innovative Solutions Private Limited<br>PYCHYSIGNALS Pvt. Ltd. |
| **Project Reports** | Compilation of coir project complete report: Techno Commercial aspects.<br>Ongoing Preparation of report for portable needle felting. |
| **Start Ups** | Applied for approval (Inprocess) |

## 6.7 RESEARCH CENTRE

**Centre Name:** POST DOCTORAL RESEARCH CENTRE

**Centre Head Name:** Dr. T. Srinivasan

| Parameter | Relevant info for the Centre |
|---|---|
| 1. Vision | To make innovation and discovery in an interdisciplinary research area |
| 2. Mission | To undertake projects in collaboration with national level laboratories like DRDO, CSIR, CECRI, and ISRO for creating novel research methodologies in product development. |
| 3. Innovation | 1. Novel Material to fabricate highly efficient solar cells.<br>2. To developed new material for Boat Built Industry<br>3. To identify the new composite materials for the development of RADOME in defence air craft<br>4. Variable child monitoring device within built heart rate measurement to protect falling into abandoned deep borewell<br>5. To developed new armour material for Automobile Applications. |
| 4. Extra Ordinary Achievements | 1. Recovery of lithium from used batteries. Received fund Rs. 57,00,000/=, from DRDO under TDF Scheme.<br><br>2. Fund received amount Rs. 3,00,000/=, from agriculture sector for life enhancement of machinery equipment's. It will improve the quality of pulses and grains and reduce the production cost. |
| 5. Patents -07 | 1. Development of R: MPPT based constant power generation controller for PV inverters. (Dr.G.Maheshwaran)<br>2. Wire arc additive manufacturing of 7075 Al alloy (Dr. Balamahendravarman)<br>3. Armour steel composite (Dr.T.Srinivasan)<br>4. Designing of stable inorganic perovskite material for solar cell applications (Dr. M.Vigneshwaran)<br>5. Heteronuclear Coordination Complexes of Cu-Mo with Sulphur and Nitrogen Containing Ligands (Dr.C. Karnan)<br>6. A System and Method of Gravitational Transportation between hills/Buildings through telescopic hydraulic system (Dr. R. Narasimhan)<br>7. Green energy based rubber sheet rolling machine with BIO GAS production (Dr. R.S. Anand).<br>8. Design and Fabrication of a chamber with a dual facility ozone refrigeration for shelf-life Extension (202141010682 Dr.C. Karnan)<br>9. Design of Suitable Ball- Mill for grinding NdFeB used Magnets recovered from hard disk, CPU fans, Ceiling Fans with BLDC motors and also from other motors and blowers (202041051764 Dr. C. Karnan)<br>10. Synthesis of Novel Organic Brucinium Benzilate [BBA] Crystal (202041010128 – Dr. C. Karnan) |

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| 6. Publications | 1. R.V. Kabilan, C. Arunagiri, G.R. Ramkumaar, K. Sathyamoorthy, C. Karnan, Combined Experimental and Theoretical Investigations on 9-[3,4-dihydroxy-5-(hydroxymethyl)oxolan-2-yl]-1,9-dihydro-6H-purin-6-one 4-nitrophenol (IPNP) Molecule, Journal of Molecular Structure, 133020, 2022, https://doi.org/10.1016/j.molstruc.2022.133020.<br>2. C. Karnan, J. Christina Rhoda, A. Manikandan, G. Vinitha, Supramolecular Assembly of Morpholin-4-ium hydroxy(diphenyl)acetate—Structural, Spectral and Nonlinear Optical Analyses, Journal of Molecular Structure, Volume 1250, Part 1, 131719, 2022, https://doi.org/10.1016/j.molstruc.2021.131719<br>3. Karnan, C., Nagaraja, K., Manivannan, S. et al. Crystal structure, spectral investigations, DFT and antimicrobial activity of brucinium benzilate (BBA). J Mol Model 27, 223 (2021). https://doi.org/10.1007/s00894-021-04842-w<br>4. M.A. Gomathi, C. Karnan, T. Sivanesan, J. Christina Rhoda, S. Manivannan, V. Ragavendran, G. Vinitha, A.R. Prabakaran, An organic benzimidazolium benzilate (BDBA) crystal: Structural description, spectral investigations, DFT calculations, thermal, photoluminescence, linear and nonlinear optical analysis, Chemical Physics Letters, 776, 138705, (2021), https://doi.org/10.1016/j.cplett.2021.138705.<br>5. Prabhaharan, M., Karnan, C., Manivannan, S. et al. Crystal Growth, Optical, Thermal, Mechanical and Laser Damage Threshold Properties of Nonlinear Optical l-Methionine Inserted Potassium Pentaborate (LMKB5) Single Crystal for Optoelectronic Applications. Journal of Elec Materi 50, 4388–4396 (2021). https://doi.org/10.1007/s11664-021-08972-y<br>6. M. Sasikala, A. Selvan, K.S. Nagaraja, R. Anuradha, C. Karnan, Spectral, antimicrobial and anticancer activity of Spectral, antimicrobial and anticancer activity of E-4-{[(5-bromothiophen-2-yl)methylidene]amino}-1,5-dimethyl-2-phenyl-1,2-dihydro-3H-pyrazol-3-one, Mol. Cryst. Liq. Cryst. 0 1–15, (2022). https://doi.org/10.1080/15421406.2021.2023398<br>7. Ponnuvel, A., Kala, A. P., Nagaraja, K. S. & Karnan, C. Polymeric coordination complex of lithium(I) with aqua and cyanurate ligands, Acta Crystallographica Section E, E77, (2021). https://doi.org/10.1107/S2056989021009324<br>8. Karnan, C. Response to Comment on: "Growth, Optical, Thermal, Mechanical, Laser Damage Threshold and Electrical Polarizability of Cadmium Chloride Doped L-Alanine (LACC) Single Crystal for Optoelectronic Applications" [J. Electron. Mater., 48, 7915–22 (2019)]. Journal of Elec Materi 50, 3757 (2021). https://doi.org/10.1007/s11664-021-08891-y<br>9. Kavitha E, Karnan C, Manivannan S, Madhavan J, Synthesis, crystal structure, vibrational, optical, thermal and photoluminescence properties of dibromidobis{2-[(2-chlorophenyl)methylidene] hydrazine-1- |

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| | carbothioamide}-cadmium [CdL2Br2], Chemical Data Collections, Volume 31, 100594, (2021). https://doi.org/10.1016/j.cdc.2020.100594<br>10. Srinivasan T, Meganathan.S, Anbarasu.P, Dharmendra.BV and Ramanan.N, Surface Characterization, Film Deposition of CrN 6959, AIP Journal of Physics, ISSN: 1742-6596 Print ISSN: 1742-6588. (Accepted)<br>11. Srinivasan. T, Arunkumar. R, Ramesh. S, Dharmendra.BV and Ramanan.N, Dissimilar Material Joint Using Friction Weld, IOP Journal of Physics, ISSN: 1742-6596 Print ISSN: 1742-6588. (Accepted)<br>12. Srinivasan. T, Balachandar. M, Venkatasubramanian. M.A, Dharmendra.BV and Ramanan.N, Experimental investigation of various techniques to adapt waste plastic oil as fuel on diesel, IOP Journal of Physics, ISSN: 1742-6596 Print ISSN: 1742-6588. (Accepted).<br>13. Periyasamy.P, Vetreselvan. E, Srinivasan. T, Vellavan. K, and Ramanan. N, Study and Optimization Process Parameter of ECMM, IOP Journal of Physics, ISSN: 1742-6596 Print ISSN: 1742-6588. (Accepted)<br>14. R. Aruna, S. Mohamed Abbas, S. Vivek, G. Suresh, C. M. Meenakshi, T. Srinivasan & K. Selva Ganapathy Evolution of 5D Printing and Its Vast Applications: A Review, Recent Advanced in Materials and Modern Manufacturing DOI: 10.1007/978-981-19-0244-4_66, pp 691–714, May 2022.<br>15. Anand, R. S., C. P. Jawahar, A. Brusly Solomon, Shibin David, Evangelos Bellos, and Zafar Said. "Experimental investigations on modified thermosyphons using R134a/Al2O3 and comparative machine learning analysis." Applied Thermal Engineering 212 (2022): 118554. (Elsevier Publication; Impact Factor 5.259)<br>16. Anand, R. S., C. P. Jawahar, A. Brusly Solomon, Evangelos Bellos, and X. Ajay Vasanth. "Experimental investigation of a two-phase closed thermosyphon with Al2O3/R134a nanorefrigerant." Proceedings of the Institution of Mechanical Engineers, Part E: Journal of Process Mechanical Engineering (2022); DOI: 10.1177/09544089221093975 (Sage Publication; Impact Factor 1.620) |
| 7. Proposals | Proposals Submitted in various Government bodies<br>***DST Proposal***<br>1. Comparative Study on the Heat Transfer Performance of Eco-friendly Refrigerants with Loop and Cylindrical Heat Pipes for cooling applications (PI: Dr. R.S Anand; Co-PI: Dr. D.B Jabaraj)<br>2. Development of Steam Turbine with Multi-Point Simultaneous Steam Injection to Individual Stages (PI: Dr. V. Natarajan; Co-PI: Dr. R.S Anand)<br>3. Modeling and Analysis Armour Vehicle Sandwich Composites (PI: Dr. MAJ.Bosco; Co-PI: Dr. T. Srinivasan)<br>4. Recycling, Development and Implementation Of Waste Ceramic Brake Pad (PI: Dr. T. Srinivasan; Co-PI: Dr. MAJ.Bosco) |

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| | 5. Study of different Mg based precursors in CsPbBr3: An approach to realize stable CsPbI3 perovskite solar cells. (PI: M.Vigneshwaran)<br>6. Design and development of arrester barrier hydraulic system for aircraft arresting. (PI: Dr. R. Narasimhan)<br>7. Experimental Investigation on microstructure and mechanical properties of wire arc additive Manufacturing of 2014 Al alloy (PI: Dr. M. Balamagendiravarman)<br>8. Design and Development of Reliable Grid Access Technology for PV powered Microgrids (PI: Dr. G. Maheshwaran)<br><br>ISRO<br>1. Development of Porous Media Based Condensing Heat exchanger for Space Systems (PI: Dr. R.S Anand; Co-PI: Dr. V. Natarajan)<br>2. Mechanical package design of light weight (<1Kg) and high RF power handling capability (20 Watts CW) for spacecraft applications. The mechanical design shall comply with EMI /EMC Mil standards. (PI: Dr. R.S Anand; Co-PI: Dr.G.Maheswaran)<br>3. Experimental and Numerical Investigation on the Delamination Modeling in Composites (PI: Dr. T. Srinivasan; Co-PI: Dr. MAJ.Bosco)<br>4. High Cycle Fatigue Testing of Metallic Materials (PI: Dr. T. Srinivasan; Co-PI: Mr.Suresh & Dr. MAJ.Bosco)<br>5. Cost effective tandem solar cell technologies for space and terrestrial applications. (PI: M.Vigneshwaran, Co-PI: Dr. M. Balamagendiravarman)<br>6. Development of novel Non-Destructive Procedure for detection and quantification of discontinuities in the bonding interfaces of explosively welded dissimilar metallic plates (PI: Dr. M. Balamagendiravarman, Co-PI: G. Maheswaran) |
| 8. MoUs | 1. RR RICE INDUSTRYPRIVATE LIMITED, Tiruvallur.<br>2. ARIVAR FARMER PRODCUCER COMPALY LIMITED, Polur |

# 7 Performance

## 7.1 PROJECTS

### 7.1.1 COMPLETED PROJECTS

| S.NO | Title | Funded Organizations |
|---|---|---|
| 1 | Design of Collapsible Mandrel System | DRDO-ASL |
| 2 | Composite Louvre for Armoured Fighting Vehicles | DRDO-CVRDE & CABS |
| 3 | Composite Shell Design, Analysis, Process Details and Tooling of Ellipsoidal Radome | |
| 4 | Indigenous CRDi Fuel Injection System of Diesel Engine for Armoured Fighting Vehicles | |
| 5 | Collapsible Mandrel System (CMS) for Solid Propellant Casting of 1m Diameter Test Motor | ISRO-VSSC |
| 6 | Development of Plant Machinery for Coir Yarn Spinning | COIR BOARD MINISTRY OF MSME |
| 7 | Design and Analysis of Cam and Sieve of Rice Polisher | MILLTEC MACHINERY LIMITED |
| 8 | Holographic Interferometer System for Bond Strength of Adhesive Joints | ANABOND LIMITED |
| 9 | Design & Development of Bio-mimic Robotic Fish Hybrid Vehicle | INDIAN INSTITUTE OF TECHNOLOGY, INDORE |
| 10 | Smart kitchen with grocery Management System | Individual Consultancy |

### 7.1.2 ONGOING PROJECTS

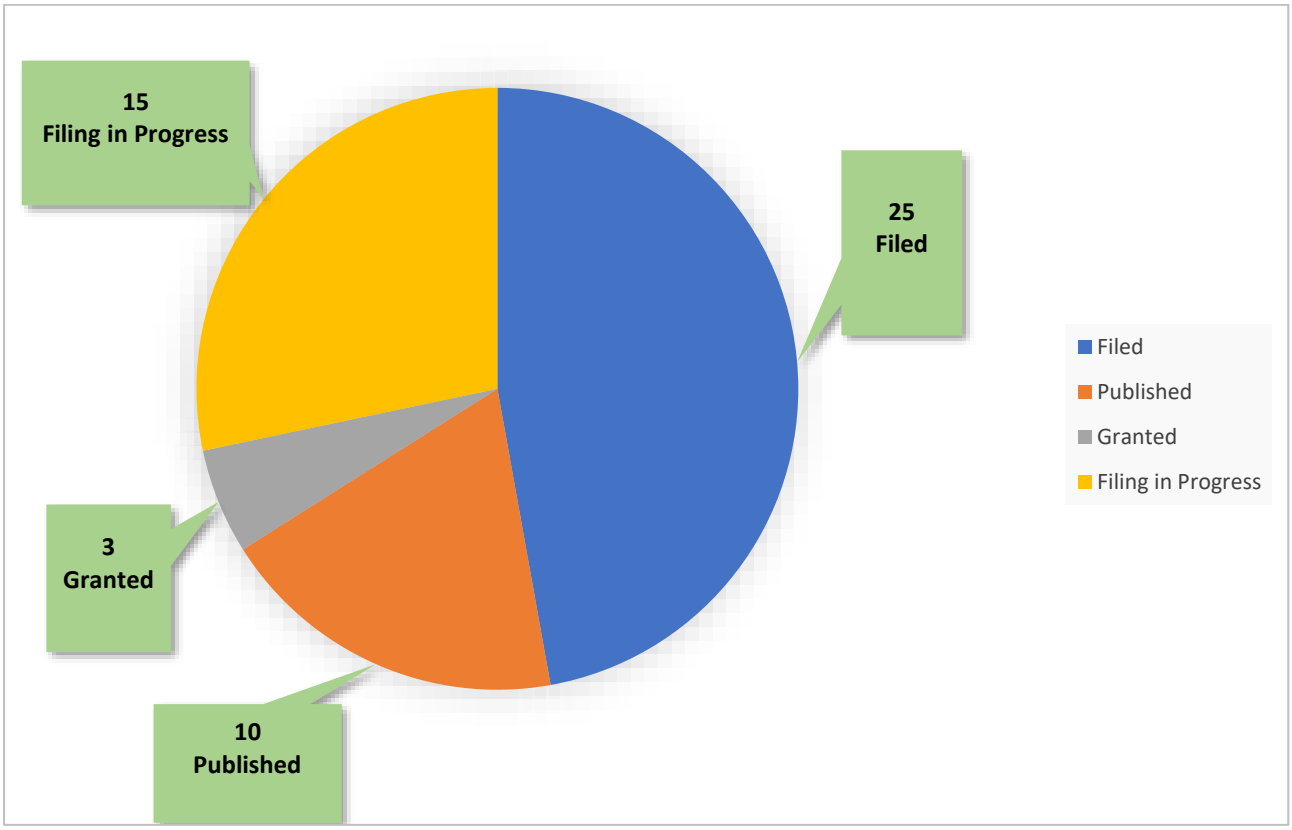
| S. No | Title | Funded Organizations |
|---|---|---|
| 1 | Recovery of Lithium precursors from used Lithium-ion batteries | DRDO NSTL, TDF & CARS |
| 2 | Feasibility Study & Development of a Self-Sustainable Dual Renewable Energy Harvesting System for Unmanned / Autonomous Ocean Surface Vehicle | |
| 3 | Design of Antenna Array with compatible Radome for marine Pollution Detection | |
| 4 | RECOVERY OF LITHIUM PRECURSORS FROM USED LITHIUM-ION BATTERIES | |
| 5 | Development of Life Enhancement material for Destoner Machine | RR Rice Industry |

### 7.1.3 UNIVERSITY FUNDED PROJECTS (COMPLETED/ON-GOING)

| S. No | **Project Title** |
|---|---|
| 1. | High Altitude (HA) Kits for 'B' Vehicle Operating in High Altitude Area (HAA) |
| 2. | Water Mobility Equipment in Creek Areas (SWAMP) |
| 3. | De-Salination Plant of Marine Craft |
| 4. | Adsorption Type Air Conditioning |
| 5. | Fire Fighting at High Altitude |
| 6. | High Speed Twister |
| 7. | A Flexible Rapier Drive System for Shuttle Loom to Rapier Loom Conversion |
| 8. | Rapier Loom for Coir Fabric Weaving |
| 9. | Coconut Husk Edge Cutting Machine |
| 10. | Needle Punching Machine |
| 11. | Ply-Yarn Twister Machine |
| 13. | Needle felting Machine |
| 14. | Tensile Tester |
| 15. | Methane Gas Sensor |
| 16. | 5kg Payload UAV |

| | |
|---|---|
| 17 | UAV-16 Litre Hybrid Drone |
| 18 | Autonomous Underwater Vehicle |
| 19 | Autonomous Disinfecting Robot |
| 20 | Groundnut Harvesting Machine |
| 21 | Truck Integrated Manipulator |
| 22 | Oil Hawk |
| 23 | Panchagavya Machine |
| 24 | 3D Printer |
| 25 | Fuel Alert System |
| 26 | Power Line Monitoring |
| 27 | Robust Dustbin |
| 28 | Auto-Parking Pre-Approved System |
| 29 | Smart Solar system |
| 30 | Milk Dispenser |

### 7.1.4 PATENTS



### 7.1.5 START-UP

ARI Start-up Facilitation Centre Established

Active start-ups in ARI : 4

Start-ups in progress : 9

# 8 Contact

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