Dr. ARUN RAPHEL
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PERSONAL DETAILS

Father's Name : Raphel M L

Date of Birth : 1st August 1989

Linguistic Proficiency : English, Hindi, Malayalam

EXPERIENCE

Faculty of Physical and Mathematical Sciences, University of Chile — Santiago, Chile
Fondecyt Postdoctoral Researcher of Mechanical Engineering Department — Apr 2026 – Till date

SRM Institute of Science and Technology (SRMIST), Vadapalani — Chennai, Tamil Nadu
Assistant Professor (Senior Grade) of Mechanical Engineering Department — Jun 2024 – Mar 2026

Viswajyothi College of Engineering and Technology (VJCET), — Ernakulum, Kerala
Assistant Professor of Mechanical Engineering Department — Jan 2015 – Jun 2024

Green Energy Materials and Manufacturing Research Group (GEMM) — Trichy, Tamil Nadu
Research Scholar of Department of Metallurgical and Materials Engineering, National Institute of Technology (NIT), Tiruchirappalli — Jan 2018 – Jul 2022

Kwality Machines — Thrissur, Kerala
Production Engineer of Food Processing Machines Division — Jul 2011 – June 2012, Jun 2014 – Dec 2014

EDUCATION

National Institute of Technology (NIT), Tiruchirappalli — Trichy, Tamil Nadu
Ph.D., Metallurgical and Materials Engineering — Aug 2022
Department of Metallurgical and Materials Engineering
Thesis: "Tuning Figure of Merit of Nanocrystalline PbSnTeSe and BiSbTeSe Thermoelectric Alloys via High Entropy Phenomena and Band Engineering"
CGPA: **9.25/10** (Course work)
Academic Advisor: Prof. Dr. S Kumaran

National Institute of Technology (NIT), Tiruchirappalli — Trichy, Tamil Nadu
M.Tech., Materials Science and Engineering — June 2014
Department of Metallurgical and Materials Engineering
Thesis: " Oxidation and Corrosion behaviour of AlCoCrFeTi High Entropy Alloy Synthesised by Mechanical Alloying and Spark Plasma Sintering "
CGPA: **8.94/10** (First Class with Distinction)

SCMS School of Engineering and Technology (SSET) — Ernakulum, Kerala
B.Tech., Mechanical Engineering — June 2011
Mahatma Gandhi University, Kottayam
Percentage: **74.86%** (First Class)

St. Antoney's Higher Secondary School — Thrissur, Kerala
Class XII, Board of Higher Secondary Exam, Kerala — Mar 2007
Percentage: **83.67%**

Carmel Higher Secondary School — Thrissur, Kerala
Class X, Board of Public Examination, Kerala — Mar 2005
Percentage: **90.91%**

AWARDS, FUNDINGS & FELLOWSHIPS

Awarded 'International Research Grant' as Principal Investigator under 'Concurso Fondecyt de Postdoctorado 2026' for 3 years at University of Chile funded by Agencia Nacional de Investigación y Desarrollo, with a total project value of CLP$ 10,136,981.45 (≈ ₹1.01 crore)	ANID, Government of Chile Apr 2026 -Mar 2029
'Project Funding' for the project entitled 'Design and Implementation of a Foldable Pneumatic Staircase System for Buses to Enhance Safety and Accessibility' under the Student Project Scheme (2024–25)	Tamil Nadu State Council for Science and Technology
'Centre for Engineering Education Excellence (CEEE) Training in the domain of Mechanical, Aerospace, and Energy Engineering, organized by the Indian National Academy of Engineering (INAE) and Infosys Foundation, with a fellowship of Rs.50,000'	IIT, Madras June 2025
'Top performer - Mechanical Engineering Department' with 1st rank for the Academic year 2021 – 2022	VJCET, Ernakulum Aug 2022
'Faculty Research Seed Fund' of Rs. 40,000 for project entitled 'Development of thermoelectric unicouple for waste heat recovery'	Lunar Rubbers Pvt. Ltd. Aug 2022
'Top performer - Mechanical Engineering Department' with 1st rankfor the Academic year 2020 – 2021	VJCET, Ernakulum Aug 2021
'Top performer - Mechanical Engineering Department' with 2nd rankfor the Academic year 2019 – 2020	VJCET, Ernakulum Aug 2020
'Post Graduate Scholarship' during M.Tech at National Institute of Technology, Tiruchirappalli	MHRD, Government of India 2012-2014

CERTIFICATIONS

Five-week online course on 'Materials Processing' authorized by Georgia Institute of Technology	Coursera, Oct 2025
Twelve-week course on "Powder Metallurgy"	NPTEL Jul – Oct 2025
Eight-week course on "Nature and Properties of Materials - An Introductory Course	NPTEL July -Sep 2024
'Fusion Adoption Training Programme on Fusion 360' Certificate ID: AP701915097497735271568	Autodesk Aug 2023
'Five-week online course on 'Materials Science: 10 Thinks Every Engineer Should Know' authorized by University of California, Davis	Coursera, Dec 2020
Four phases of AICTE-sponsored Short Term Training Program on 'Recent Advances in Tribology and Surface Engineering'	Saintgits, Kottayam Nov – Dec 2020
Two Weeks Training Program on 'Managing Online Classes and Co-Creating MOOCS' by Teachers Learning Centre	University of Delhi Apr – May 2020
Three-week International Workshop on 'Laser Engraving and 3D Printing'	Senior Experten Service, Germany, Dec 2018
Short Term Course on 'Thermoelectric Materials and its Applications'	Indian Institute of Science, Bangalore, June 2018
'Diploma in Mechanical CADD' from CADD Centre Training Services Pvt Ltd.	CADD Centre Jun 2011

ORGANIZATIONAL ENGAGEMENTS

Coordinator for AICTE-sponsored STTP on 'IoT Based Manufacturing & Design - Challenges & Opportunity' Phase 01	VJCET, Ernakulum Nov 2020
Coordinator for AICTE-sponsored STTP on 'IoT Based Manufacturing & Design - Challenges & Opportunity' Phase 02	VJCET, Ernakulum Dec 2020
Coordinator for Two day International seminar on 'Materials: Engineering for Sustainability'	VJCET, Ernakulum July 2019
Coordinator for National Conference on 'Emerging Vistas of Engineering and Management (NCEVEM'19)'	VJCET, Ernakulum Mar 2019
Member of the International Association of Engineers	Membership No: 157091

ACADEMIC & ADMINISTRATIVE RESPONSIBILITIES

TEACHING

COURSES HANDLED:

1. Metallurgy & Material Science (MET205)
2. Manufacturing Process (MET204)
3. Machine Tools Lab-I (MEL204)
4. Advanced Manufacturing Engineering (MET306)
5. Material Science & Technology (MET285)
6. Manufacturing Technology (MET286)
7. Introduction to Drones (21MEO115T)
8. Basics of Mechanical Engineering

ADMINISTRATIVE RESPONSIBILITIES

1. Department representative for Center for Research and Faculty Development & Consultancy
2. Member for Internal Quality Audit Cell (University Examination)
3. Member for Internal Quality Audit Cell (College Library)
4. Member for College NBA and NAAC accreditation committee

RESEARCH PROFILE

ORCiD Author ID	:	**0000-0003-0362-5658**	Total no of Publications	:	**21**
Scopus Author ID	:	**57194042661**	SCI Indexed Journals	:	**9**
Web of Science ID	:	**AAU-6898-2020**	Scopus Indexed Journals	:	**6**
No of citation	:	**250**	Peer-reviewed Journals	:	**4**
h-index	:	**8**	International Conferences	:	**7**
i10-index	:	**8**	Book Chapter	:	**5**
Patent Granted:		**1**	Editor of Journals	:	**1**

EDITORIAL ASSIGNMENTS

Editor for the bi-annual National Journal 'Technology and Future: Journal of science and Technology', Volume VIII Issue -I, January-June 2021, ISSN: 2454-4051

CONFERENCES

International Conference on International Conference on Condensed Matter Physics and Nanotechnology (ICCMPN-2025)	SRMIST, Chennai Sep 2025
International Conference on Frontiers in Materials, Analysis, and Manufacturing (ICFMAM-2025)	SPCET, Chennai Sep 2025
International Conference on Materials for Energy, Environment and Healthcare (MEEHCON'24)	NIT, Calicut Dec 2024
International Conference on Wearable Technologies andApplications: Emerging Trends and Innovations	VIT Vellore June 2020
5th International Conference on Materials Processing and Characterization (ICMPC-2016)	GRIET, Hyderabad Mar 2016
International Conference on Advances in Materials Manufacturingand Applications (AMMA-2015)	NIT Trichy Mar 2015

SELECTED PUBLICATIONS

1. Shunmugesh, **Arun Raphel**, Shivashankarayya Hiremath, Vishwanatha H M *et al.* (2026) 'Optimizing WAAM process parameters using statistical tools and prediction of input parameters using machine learning models for depositing ER70S' ,Journal of Materials Research and Technology, Elsevier, https://doi.org/10.1016/j.jmrt.2026.02.109 [SCIE indexed, Impact Factor: **7.3, Q1**]
2. Shunmugesh, **Arun Raphel**, Sony Kurian, Vishwanatha H M *et al.* (2025) 'A newer way to optimize the process parameters by integrating grey relational co-efficient and combined compromise solution for machining the CFRP composites', Scientific Reports, Nature https://doi.org/10.1038/s41598-025-18368-1 [SCIE indexed, Impact Factor: **4.9, Q1**]
3. Shunmugesh, K., Mathew, S., **Arun Raphel**. *et al.* (2025) 'Investigation of wire arc additive manufacturing of cylindrical components by using cold metal transfer arc welding process', Scientific Reports 15, 21599 https://doi.org/10.1038/s41598-025-05434-x [SCIE indexed, Impact Factor: **4.9, Q1**]
4. **Arun Raphel**, P Vivekanandhan, S Kumaran (2024) 'Tuning p-type semiconduction with ultra-low thermal conductivity in nanocrystalline n-type BiSbTe1. 5Se1.5 high entropy alloy via Ag doping', Applied Physics A; Materials Science & Processing, Springer 130,389 p1-8, Available at: https://doi.org/10.1007/s00339-024-07553-0 [SCI indexed, Impact Factor: **3.0, Q2**]
5. **Arun Raphel**, P Vivekanandhan, Arun Kumar Rajasekaran, S Kumaran (2023) 'Tuning thermoelectric figure of merit in Ag-doped nanostructured PbSnTeSe alloy by entropy and band engineering phenomena', Materials Today Communications, 35, p. 105880. Available at: https://doi.org/10.1016/j.mtcomm.2023.105880. [SCI indexed, Impact Factor: **4.9, Q2**]
6. **Arun Raphel**, P Vivekanandhan, Arun Kumar Rajasekaran, S Kumaran (2022) 'Tuning figure of merit in Na doped nanocrystalline PbSnTeSe high entropy alloy via band engineering', Materials Science in Semic onductor Processing, 138, p. 106270. Available at: https://doi.org/10.1016/j.mssp.2021.106270. [SCI indexed, Impact Factor: **5.2, Q1**]
7. **Arun Raphel**, Appu Kumar Singh, P Vivekanandhan, S Kumaran (2021) 'Thermoelec tric performanc e of nanostructured PbSnTeSe high entropy thermoelec tric alloy synthesized via spark plasma sintering', Physica B: Condensed Matter, 622, p. 413319. Available at: https://doi.org/10.1016/j.physb.2021.413319. [SCI indexed, Impact Factor: **3.2, Q2**]
8. **Arun Raphel**, P Vivekanandhan, Appu Kumar Singh, S Kumaran (2021) 'High entropy stabilization and band engineering driven high figure of merit in nanostructured PbSn0.875TeSeBi0.125 alloy', Journal of Solid State Chemistry, 303, p. 122531. Available at: https://doi.org/10.1016/j.jssc.2021.122531. [SCI indexed, Impact Factor: **3.2, Q2**]
9. **Arun Raphel**, P Vivekanandhan, S Kumaran (2020) 'High entropy phenomena induced low thermal conductivity in BiSbTe1.5Se1.5 thermoelec tric alloy through mec hanical alloying and spa rk plasma sintering', Materials Letters, 269, p. 127672. Available at: https://doi.org/10.1016/j.matlet.2020.127672. [SCI indexed, Impact Factor: **2.6, Q2**]

10. **Arun Raphel**, Vinoadhkumar K, Vivekanandhan P, and Kumaran S, Phase evolution and Characteristics of mechanically alloyed and spark plasma sintered high entropy AlCoCrFeTi alloy, Springer Proceedings in Materials, Springer Nature, ISSN 2662-3161 [Scopus indexed] (**Accepted for Publication; Under Press**)
11. **Arun Raphel**, K Shunmugesh, Praveen A S, and Arun S, Material and design optimization of nature-inspired cellular structures for bioimplants, Springer Proceedings in Materials, Springer Nature, ISSN 2662-3161[Scopus indexed] (**Accepted for Publication; Under Press**)
12. Muhammad Anaz Khan, **Arun Raphel**, Syed Mujahed Hussaini, and Biju Cherian Abraham, AI-Enhanced ANFIS Model for Predictive Analysis and Optimization of Additively Manufactured PLA-CF Components, AIP Conference Proceedings [Scopus indexed, ISSN No: 1551-7616] (**Accepted for Publication; Under Press**)
13. Lokasani Bhanuprakash, N Manikandan, **Arun Raphel**, Georgekutty S Mangalathu (2023) 'Experime ntal investigation on mec hanical properties of Kenaf fibre reinforced epoxy composites with annona squamosa powder', Materials Today: Proceedings. Available at: https://doi.org/10.1016/j.matpr.2023.06.247. [Scopus indexed]
14. K Shunmugesh, **Arun Raphel**, TG Unnikrishnan, KT Akhil (2023) 'Finite element modelling of carbon fiber reinforced with vespel and honey-comb structure', Materials Today: Proceedings, 72, pp. 2163 – 2168. Available at: https://doi.org/10.1016/j.matpr.2022.08.301. [Scopus indexed]
15. KT Akhil, Jerry Varghese, **Arun Raphel**, K Vinoj, Frenosh K Francis (2017) 'To Study the Cooling Rate and Influence of Boron Carbide on Mechanical Properties of Aluminium LM13 Matrix B4C Reinforced Composites', Materials Today: Proceedings, 4(8), pp. 7202–7207. Available at: https://doi.org/10.1016/j.matpr.2017.07.047. [Scopus indexed]
16. **Arun Raphel**, S Kumaran, K Vinoadh Kumar, Lovin Varghese (2017) 'Oxidation and Corrosion resistance of AlCoCrFeTi High Entropy Alloy', Materials Today: Proceedings, 4(2, Part A), pp. 195 – 202. Available at: https://doi.org/10.1016/j.matpr.2017.01.013. [Scopus indexed]

BOOK CHAPTERS

1. **Arun Raphel**, P Vivekanandhan, S Kumaran (2023) 'Green energy harvesting using high entropy thermoelectric alloys', in Computational Intelligence based Optimization of Manufacturing Process for Sustainable Materials. CRC Press. Available at: https://doi.org/10.1201/9781003257714
2. K Shunmugesh, KR Arun, **Arun Raphel**, KT Akhil (2021)'Optimization of Drilling Parameters of Glass Fiber-Reinforced Polymers Using Grey Relational Analysis', Recent Advances in Mechanical Engineering, Springer, pp. 319–324. Available at: https://doi.org/10.1007/978-981-15-8704-7_40
3. Arun Nellaiappan T, **Arun Raphel**, Arun S, Joseph J, Anjilavellil T (2025) 'Advances in Additive Manufacturing for Biomedical Applications'. In: Khan M., A., Singh, G., Sulaiman, S. (eds) Challenges and Innovations in 3D Printed Bio-Organs and Their Materials. Springer Tracts in Additive Manufacturing. Springer, Cham. Available at: https://doi.org/10.1007/978-3-031-90807-1_6
4. P. Vivekanandhan, **Arun Raphel**, R. Murugasami, S. Kumaran, Spark plasma sintering - An overviews, In: M. Arun Prasad, Sachin Salunkhe, J. Paulo Davim, In Woodhead Publishing Reviews: Mechanical Engineering Series, Powder Metallurgy, Woodhead Publishing, Elsevier, 253-268 (2025),ISBN 9780443220258. https://doi.org/10.1016/B978-0-443-22025-8.00014-0.
5. Manuel Thomas, Rittin Abraham Kurien, Akash Paul Savio, and Arun Raphel, Recent Trends and Future Scope of Natural Fiber Composites In: Jibin T. Philip , Jerin Jose , Soney C. George (eds) Natural Fiber Composites for a Sustainable Environment,CRC Press. Available at: https://doi.org/10.1201/9781032665337

PATENT GRANTED

1. **Arun Raphel**, Aswin Raphel, Rappai M. L., Rahul Krishnan R., Shunmugesh K., Arun S., Praveen A. S. (2025). Portable Rice Powder Steamer Machine (Indian Design No. 464419-001), Controller General of Patents, Designs and TradeMarks, India.

RESEARCH EXPERTISE & HANDS-ON EXPERIENCES

EXPERTISE

- Design and development of Multi-component alloys and High entropy alloys for various functional and structural applications
- Design and development of thermoelectric materials for energy harvesting
- Development of Nanostructured materials and Semiconductor materials
- Expertise in Powder processing technology via Mechanical alloying and spark plasma sintering
- Development of Swift and novel processing route for synthesis of thermoelectric high entropy alloys
- Expertise in various Material testing and characterization

HANDS-ON EXPERIENCES

- High Energy Ball Milling
- Spark Plasma Sintering Unit
- Glove Box & Hot Furnace
- X-ray Diffraction Analysis
- Simultaneous Thermal Analyzer
- Scanning Electron Microscope with elemental map
- Transmission Electron Microscopic studies
- Density measurement kit
- Vickers microhardness tester
- Seebeck coefficient and Electrical resistivity apparatus

REFERENCES

Dr. S Kumaran,
Professor,
Metallurgical and Materials Engineering Department, NIT Trichy
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Dr. P. Vivekanandan
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International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), Hyderabad
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Professor and Head,
Mechanical Engineering Department
Viswajyothi College of Engineering and Technology, Ernakulum.
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Place: Santiago
Date: 27/07/2026



(**Arun Raphel**)