

**International Conference
on
Scientific Research and Revolution**

ICSRR 2025

August 17, 2025
(Virtual Mode)

Organised By



SCIENTIFIC RESEARCH REPORTS
(A Book Publisher, approved by Govt. of India)

Chennai - 600 087, Tamil Nadu, India.

www.srrbooks.in

**Proceedings of
International Conference on
Scientific Research and Revolution**

ICSRR 2025

August 17, 2025

EDITORS

Dr. J. ARUNPRASAD

University of the Witwatersrand
Johannesburg 2000, South Africa.

Dr. SIVANRAJU RAJKUMAR

Institute of Technology, Hawassa University
Hawassa, Ethiopia.

Dr. SHARAD K PASALE

Thakur College of Science and Commerce
Kandivali, Mumbai, India.

Dr. M. CHANDRASEKAR

K.Ramakrishnan College of Technology
Trichy, India.

ICSRR 2025, August 2025

ISBN: 978-81-987134-4-5



© Copyrights reserved by Authors and Publishers

Despite our best efforts, there is still a risk that some errors and omissions might occur unintentionally.

Without the prior consent of the authors and publishers, no part of this publication may be duplicated in any form or by any means, whether electronically, by photocopying, or otherwise.

The opinions and findings expressed in the individual chapters are those of the authors, not the publishers.

Cover page images attributed from www.freepik.com, www.vecteezy.com

Published By



SCIENTIFIC RESEARCH REPORTS
(A Book Publisher, approved by Govt. of India)

I Floor, S S Nagar, Chennai - 600 087,
Tamil Nadu, India.

editors@srrbooks.in, contact@srrbooks.in
www.srrbooks.in

ABOUT CONFERENCE

The **International Conference on Scientific Research and Revolution (ICSRR 2025)**, scheduled for August 17, 2025, will be conducted in virtual mode, providing a global platform for researchers, academicians, and industry professionals to share ground-breaking ideas and transformative innovations. This conference will spotlight pioneering research and revolutionary approaches across diverse scientific domains, fostering discussions that challenge conventional thinking and open new frontiers of knowledge.

Through engaging technical sessions and thought-provoking presentations, participants will explore emerging trends, disruptive technologies, and forward-looking solutions that have the potential to shape the future of science and society. Experts from multiple disciplines—including engineering, natural sciences, social sciences, technology, and management—will come together to present cutting-edge work and address pressing global and societal challenges.

With a strong focus on collaboration, innovation, and impactful outcomes, ICSRR 2025 will serve as a unique forum for networking, exchanging ideas, and inspiring research that can lead to meaningful change. Leveraging virtual technologies, the conference aims to ensure inclusivity and reach, enabling participation from across the globe in this pivotal dialogue on the evolution and revolution of scientific research.

ABOUT ORGANIZER

Scientific Research Reports (SRR Books) is an innovative publishing company that publishes digital books in a wide range of arts, social, science, and technology fields and is registered and approved as a digital book publisher with the Government of India. The goal of the Scientific Research Reports is to encourage the dissemination of both fundamental and applied research across the various academic fields and research communities located all over the world. In addition to this, it intends to create research networking among the many different research groups and encourage conversation on emerging research standards

Chief Editor:

Mrs. K. LAKSHMI DEVI

SRR Books, Chennai

Associate Editors:

Mr. S. KAMACHI, SRR Books, Chennai

Mrs. B. BHARATHI, SRR Books, Chennai

Technical Committee Members:

Dr. K. KRISHNAKUMAR

University of Technology and Applied Sciences, Sultanate of Oman.

Dr. S. BASKAR

Vels Institute of Science, Technology & Advanced Studies, Chennai.

Advisory Committee Members:

Dr. ABHISHEK SHARMA

Government Engineering College Palamu, Medininagar, Jharkhand, India.

Dr S GANESAN

Sathyabama Institute of Science and Technology, Chennai, India.

Dr. R. SRIDHAR

Department of Mechanical Engineering, VISTAS, Chennai

Dr. M. RUBAN

Department of Mechanical Engineering, VISTAS, Chennai

Mr. A ARUN

School of Hotel and Catering Management, VISTAS, Chennai



Dr. J. Arunprasad is a faculty member at the School of Mechanical, Industrial, and Aeronautical Engineering, University of the Witwatersrand, Johannesburg, South Africa. He specializes in advanced manufacturing, materials engineering, and mechanical system design. With significant research contributions, he has published in high-impact journals and presented at reputed international conferences. As the corresponding author for several studies, Dr. Arunprasad actively collaborates with global research communities to address industrial and societal challenges through innovative engineering solutions. His dedication to academic excellence, research innovation, and mentoring has established him as a respected professional in the field.



Dr. Sivanraju Rajkumar is a faculty member in the Department of Mechanical Engineering, Faculty of Manufacturing, Institute of Technology, Hawassa University, Hawassa, Ethiopia. He has extensive teaching and research experience in manufacturing engineering, materials science, and mechanical design. His academic contributions include publishing research articles in reputed journals, guiding student projects, and participating in international conferences. Dr. Rajkumar is dedicated to advancing engineering education through innovative teaching methods, industry-oriented research, and skill development initiatives. His commitment to academic excellence and knowledge transfer has made him a valued mentor and contributor to the growth of the mechanical engineering discipline.



Dr. Sharad K. Pasale earned his Ph.D. in Chemistry from the University of Rome Tor Vergata, Italy, in 2014, after completing his M.Sc. in Organic Chemistry from Maulana Azad Research Center, Dr. Babasaheb Ambedkar Marathwada University (2006) and B.Sc. in Chemistry from Dayanand College, Solapur (2004). He worked as a Research Associate at CSIR-National Chemical Laboratory, Pune, and collaborated with Oxford University during his Ph.D., visiting 14 countries for research. He has published over 14 papers, authored five books, and received multiple awards. Currently, as Assistant Professor at Thakur College, Mumbai, he inspires students through his research on heterocycles, polymers, and soft materials.



Dr. M. Chandrasekar is a Professor in the Department of Mechanical Engineering at K. Ramakrishnan College of Technology, Samayapuram, Trichy, India. With extensive academic and research experience, he specializes in areas such as nanomaterials, advanced manufacturing, and mechanical system design. He has guided numerous student projects, published research papers in reputed journals, and actively contributed to conferences and workshops. Dr. Chandrasekar is committed to fostering innovation, skill development, and industry-academia collaboration. His expertise and dedication have significantly advanced the department's academic excellence and research output, making him a respected educator and mentor in the engineering community.

ICSRR 2025 - Paper Index

Paper ID	Paper Title	Page No.
E001	AI-DRIVEN APPROACHES TO TRANSFORM WORKFORCE PERFORMANCE PREDICTION	1
E002	TRANSFORMING POWER NETWORKS: THE ROLE OF SMART GRIDS AND SCADA IN THE FUTURE	2
E003	DRILLING CHARACTERISTICS STUDY ON HUMAN HAIR REINFORCED PLASTIC COMPOSITES	3
S004	ORGANIC FERTILIZERS AND SOIL CONDITIONERS FROM AGRICULTURAL WASTE	4
S005	GREEN SYNTHESIS OF SILVER NANOPARTICLES USING PLANTS EXTRACT AND ANALYSIS OF THEIR ANTIMICROBIAL ACTIVITY	5
E006	GREEN ALTERNATIVES IN FIBER-REINFORCED CONCRETE: A FUTURE-READY APPROACH	6
S007	ADVANCES IN PHOTOVOLTAICS SCIENCE: NEXT-GEN MATERIALS AND SMART ENERGY SOLUTIONS	7
S008	MACHINE LEARNING FOR INTRUSION DETECTION AND ANOMALY DETECTION	8
M009	SUSTAINABLE DEVELOPMENT OF MICROBIAL HYDROGEL MATRIX FOR STRUCTURAL CRACK REPAIR -- A REVIEW	9
E010	ENGINEERED MICROBES FOR THE CONVERSION OF CO ₂ INTO VALUABLE BIOBASED PRODUCTS: A REVIEW	10
E011	OUTCOME BASED EDUCATION ON AI TECHNOLOGY	11
S012	GENUS SUAEDA: ADVANCES IN PHARMACOLOGY AND CLINICAL APPLICATIONS SUPPORTING SDG 3 -- GOOD HEALTH AND WELL-BEING	12
M013	A STUDY ON RURAL WOMEN ENTREPRENEURSHIP AND MICRO ENTERPRISE DEVELOPMENT IN INDIA	14

Paper ID	Paper Title	Page No.
E014	FUNGAL MYCELIUM IN BIOPACKAGING: SAFETY, SUSTAINABILITY, AND INDUSTRIAL PROSPECTS	15
S015	THE MULTIFACETED CHALLENGE OF ULCERATIVE COLITIS: A REVIEW	16
M016	IMPACT OF COVID-19 CRISIS ON HUMAN RESOURCE MANAGEMENT AND DIGITALISATION OF WORK WITH SPECIAL REFERENCE TO CHENNAI BASED COMPANIES	17
E017	THE BOT (INTEGRATION OF BLOCKCHAIN WITH IOT) IN TRANSPORTATION	18
E018	LOW-COST IOT LOGGER FOR MONITORING CARBON EMISSION & ENERGY WASTE IN MSME UNITS	19
M019	COMMEMORATING REVOLUTION: ANALYSING MEMORY TOURISM THROUGH CULTURAL MEMORY AT THE PUNNAPRA-VAYALAR MEMORIAL IN KERALA	20
S020	GASTRO-RETENTIVE FLOATING SYSTEM FOR CONTROLLED RELEASE: A NATURAL POLYMER APPROACH	21
M021	TRAUMA WITHOUT VIOLENCE: EXPLORING THE LINGERING WOUNDS OF SILENCE, NEGLECT, AND EMOTIONAL ABSENCE THROUGH AMERICAN MEMOIRS	22
S022	SUGAR DEGRADING BACTERIA WITH THE WASTE PEEL OF VEGETABLE AND FRUITS	23
E023	SMART MARKET FORECASTING FOR SUSTAINABLE ECONOMIC GROWTH: ADVANCING SDG 8 & 9 THROUGH PREDICTIVE FINANCIAL TECHNOLOGY	24
E024	BEYOND CHATBOTS: DESIGNING EMPATHETIC AI COMPANIONS FOR EMOTIONAL HEALTH	25
E025	IMPROVING 5G NETWORK PROTECTION THROUGH TWO-WAY AUTHENTICATION AND ATTRIBUTE BASED ENCRYPTION MECHANISMS	26
S026	HASH FUNCTIONS IN CRYPTOGRAPHY	27

Paper ID	Paper Title	Page No.
S027	ARITHMETIC CONCEPTS IN KANAKKATIKARAM THROUGH TRANSLATION	28
M028	AI ON MULTIDISCIPLINARY MARKETING TECHNOLOGY	29
S029	CONTROLLED GROWTH OF MULTI-WALLED CNTS VIA FE--MO SUPPORTED ON ALUMINA	30
S030	SOLVABILITY OF PEG SOLITAIRE ON OCTAHEDRAL GRAPH	31
E031	A STUDY ON THE IMPACT OF SMART TRAFFIC MANAGEMENT SYSTEMS ON URBAN CONGESTION	32
M032	ANALYZING THE DYNAMICS OF PLACE IDENTITY FORMATION THROUGH MULTI-REALITY BRANDING FRAMEWORKS	33
M033	THE ROLE OF IDENTITY AND INNER TRANSFORMATION IN BRANDING TRAVEL AS A PILGRIMAGE EXPERIENCE	34
M034	A STUDY ON PERFORMANCE AND ADAPTABILITY OF AGENTIC AI IN SIMULATED ENVIRONMENTS	35
M035	A STUDY ON ENHANCING TRUST AND INTERPRETABILITY: THE ROLE OF EXPLAINABLE AI IN BUSINESS ANALYTICS	36
M036	A STUDY ON THE IMPACT OF CONVERSATIONAL INTERFACES ON BUSINESS INTELLIGENCE AND USER EXPERIENCE	37
M037	A STUDY ON INTEGRATION OF AI/ML WITH TRADITIONAL BUSINESS INTELLIGENCE: A SYNERGISTIC APPROACH FOR ENHANCED DATA-DRIVEN DECISION MAKING	38
M038	EFFECTIVE LEADERSHIP DEVELOPMENT AND TEAM MANAGEMENT: STRATEGIES FOR SUCCESS	39
E039	SMART PROSTHETIC THUMB CONTROLLED BY EMG SIGNALS: DESIGN AND BUILD	40
M040	REDEFINING HUMAN CAPITAL MANAGEMENT WITH HRIS: PATHWAYS TO HR 4.0	41

Paper ID	Paper Title	Page No.
E041	EVALUATION OF THE COMBUSTION AND EMISSIONS PERFORMANCE OF NEEM (AZADIRACHTA INDICA) BIODIESEL IN A COMPRESSION IGNITION ENGINE	42
S042	UNVEILING THE ADJUVANT THERAPEUTIC POTENTIAL OF DABRAFENIB DERIVATIVES IN LUNG ADENOCARCINOMA VIA <i>IN SILICO</i> MULTI-TARGETING OF B-RAF, NEK11, AND S1K1	43
S043	STRUCTURE-BASED DRUG DESIGN OF SHIKIMIC ACID AS A PUTATIVE DRUG TARGET FOR BRCA VIA <i>IN SILICO</i> METHOD	44
M044	NANOTECHNOLOGY IN ADVANCED MATERIALS AND BIOFUEL SYSTEMS: A SUSTAINABLE APPROACH	45
E045	INTEGRATING NANOMATERIALS FOR HIGH-PERFORMANCE MATERIALS AND GREEN BIOFUEL TECHNOLOGIES	46
S046	POWER EDGE DOMINATION NUMBER ON MYCIELSKIAN OF CERTAIN SPECIAL GRAPHS	47
S047	TIME SERIES ANALYSIS OF SALES PRICES IN THE FOOD AND BEVERAGE SECTOR IN INDIA	48
S048	EFFECT OF ANTIBACTERIAL PROPERTIES ON THE SIZE OF TEMPERATURE DEPENDENT GREEN SYNTHESIZED SILVER NANOPARTICLES	49
E049	A FLOWER POLLINATION ALGORITHM APPROACH FOR OPTIMAL REACTIVE POWER DISPATCH	50
E050	KRILL HERD ALGORITHM-BASED APPROACH FOR COMBINED ECONOMIC AND EMISSION DISPATCH OPTIMIZATION	51
M051	FOOD SAFETY AND HYGIENE MANAGEMENT: POST-COVID STANDARDS AND CONSUMER EXPECTATIONS	52
M052	EXPLORING EMOTIONAL INTELLIGENCE AND SERVICE EXCELLENCE IN HOTEL AND TOURISM OPERATIONS	53

Paper ID	Paper Title	Page No.
M053	OPTIMIZING KITCHEN WORKFLOW AND ERGONOMICS IN HOTEL FOOD PRODUCTION	54
M054	A QUANTITATIVE ANALYSIS OF INDUSTRY PERCEPTIONS AND IMPLEMENTATION OF SUSTAINABLE HOUSEKEEPING PRACTICES	55
M055	A STUDY ON THE INFLUENCE OF CULTURAL TOURISM ON THE PRESERVATION OF HERITAGE AND LOCAL IDENTITY	56
M056	A PRAGMATIC STUDY ON WASTE MINIMIZATION PRACTICES IN HOTELS	57
M057	A REVIEW OF GUEST EXPERIENCE ENHANCEMENT STRATEGIES IN FINE DINING SERVICE	58
M058	EVALUATING THE INFLUENCE OF EMPLOYEE TRAINING ON PERFORMANCE AND SERVICE QUALITY IN THE HOTEL INDUSTRY	59
S059	A MORDERN APPROACH TO DRUG DISCOVERY	60
S060	COMPARATIVE MORPHOLOGY OF HAEMIN CRYSTALS IN HEN, HUMAN AND FISH BLOOD SAMPLES	61
E061	DEVELOPMENT OF A LOW-COST REHABILITATION DEVICE FOR STROKE PATIENTS: ROBO REHEB (MOBAID)	62
E062	LIGHTWEIGHT MAGNESIUM ALLOY COMPOSITES FOR ENHANCED AUTOMOBILE PERFORMANCE AND FUEL EFFICIENCY	63
E063	REVIEW OF HYDROGEN EMBRITTLEMENT MECHANISMS IN HIGH-STRENGTH ALUMINUM ALLOYS: MICROSTRUCTURAL INFLUENCES AND MITIGATION STRATEGIES	64
E064	SURFACE ENGINEERING OF 316L STAINLESS STEEL USING DUPLEX CRN/TIN COATINGS VIA DC MAGNETRON	65

Paper ID	Paper Title	Page No.
	SPUTTERING: MICROSTRUCTURAL, TRIBOLOGICAL, AND HARDNESS EVALUATION	
E065	INDUSTRIAL CYCLE TIME OPTIMIZATION USING MECHANIZED EQUIPMENT AND SIX SIGMA METHODOLOGY	66
E066	A COMPREHENSIVE REVIEW OF NANO ADDITIVES APPLICATIONS FOR ENHANCING PALM BIODIESEL PERFORMANCE IN INTERNAL COMBUSTION ENGINE	67
E067	ALGAE-BASED CARBON EMISSION CONTROL PRODUCT DESIGN FOR ENVIRONMENT	68
E068	INTELLIGENT GAS LEAK DETECTION WITH AUTOMATED SAFETY ALERTS	69
E069	DESIGN, SIMULATION AND ANALYSIS OF FLOATING ROTOR BRAKE PLATE	70
E070	CONVERSION OF WASTE PLASTIC INTO OIL: TECHNOLOGIES, CHALLENGES, AND PROSPECTS	71
S071	EFFECT OF TOUGHENER ON MOISTURE ABSORPTION AND GLASS TRANSITION TEMPERATURE OF GLASS / PHENOLIC LAMINATES	72
S072	ARTIFICIAL INTELLIGENCE IN PHARMACY: THE FUTURE OF DRUG DESIGN	73
E073	REVIEW ON RECENT WEARABLE TECHNOLOGY FOR RESPIRATION MONITORING	73
M074	A STUDY ON CONSUMER BEHAVIOUR IN FAST MOVING CONSUMER GOODS -- DESCRIPTIVE ANALYSIS	75
M075	EFFECTIVE LEADERSHIP DEVELOPMENT AND TEAM MANAGEMENT: STRATEGIES FOR SUCCESS	76

Paper ID	Paper Title	Page No.
E076	SMART SLEEP APNEA MONITORING DEVICE	77
S077	SELF-MICROEMULSIFYING DRUG DELIVERY SYSTEMS (SMEDDS) FOR PHYTOPHARMACEUTICALS	78
S078	HARMONIOUS CHROMATIC NUMBER OF AT LEAST ONE DEGREE OF VERTICES IN CERTAIN GRAPHS	79
S079	WO ₃ /TiO ₂ /CeO ₂ NANOCOMPOSITES: FABRICATION APPROACHES AND THEIR ANTIBACTERIAL AND ANTIFUNGAL POTENTIALS	80
S080	GREEN SYNTHESIS OF SELENIUM NANOPARTICLES USING LEAF EXTRACT OF <i>MUKIA MADERASAPATANA</i> AND DECIPHERING ITS BIOMEDICINAL PROPERTIES	81
S081	THE THIRD SPACE IN TRANSIT: HYBRIDITY IN <i>MEMORIES OF RAIN</i> AND <i>A SIN OF COLOUR</i>	82
S082	CUTTING THROUGH SILENCE: A SOCIO-LITERARY STUDY OF BAMA'S <i>KARUKKU</i>	83
S083	REIMAGINING THE SACRED FEMININE: A FEMINIST LITERARY ANALYSIS OF DEVDUTT PATTANAIK'S <i>SITA</i> AND KAVITA KANE'S <i>KARNA'S WIFE</i>	84
S084	CULINARY MEMORY AND FEMININE AGENCY: FOOD AS NARRATIVE POWER IN <i>LIKE WATER FOR CHOCOLATE</i> AND <i>SERVING CRAZY WITH CURRY</i>	85
M085	NATURE OF INDIAN TOURISM WITH RESPECT TO DOMESTIC AND INTERNATIONAL VISITORS	86

ICSRR – M044

NANOTECHNOLOGY IN ADVANCED MATERIALS AND BIOFUEL SYSTEMS: A SUSTAINABLE APPROACH

Nalini Ramachandran U¹, R. Surendran², S. Arunkumar³, Jagadeesh P⁴

¹Assistant Professor, Department of Applied Sciences, Chemistry Section University of Technology and Applied Sciences Muscat, Sultanate of Oman, naliniuthaman@gmail.com

²Assistant Professor, Department of Mechanical Engineering, K. S. R. College of Engineering, Tiruchengode, surenbe@gmail.com

³Assistant Professor, Department of Mechanical Engineering, Vels Institute of Science, Technology & Advanced Studies, Chennai 600117, Tamil Nadu, India, gct.arunkumar@gmail.com

⁴Assistant Professor, Department of Mechanical Engineering, K. S. R. College of Engineering, Tiruchengode, pvjagadeesh88@gmail.com

Abstract:

Nanotechnology has emerged as a transformative tool in the development of advanced materials and biofuel systems, offering innovative solutions to pressing sustainability challenges. This chapter explores the integration of nanostructured materials, nanoparticles, and nano-catalysts in enhancing the efficiency, performance, and environmental compatibility of biofuel production processes. Special emphasis is placed on the role of nanomaterials in improving feedstock conversion, reducing processing costs, and increasing energy yield. The chapter also examines the development of advanced composites, coatings, and functional materials enabled by nanotechnology to improve durability, thermal stability, and biodegradability, thus supporting a circular economy. Furthermore, it highlights case studies demonstrating successful industrial applications, lifecycle assessments, and techno-economic analyses of nanotechnology-enabled biofuel systems. By bridging material science innovations with renewable energy technologies, this sustainable approach aims to advance cleaner energy production and resource efficiency, aligning with global decarbonization and climate change mitigation goals.

Keywords: *Nanotechnology, Advanced materials, Biofuel systems, Nano-catalysts, Sustainable energy, Renewable feedstock, Biomass conversion, Energy efficiency, Circular economy, Green technology*

ISBN 978-819871344-5



9 788198 713445