The Scheme for Promotion of Academic and Research Collaboration (SPARC)

An initiative from the Ministry of Education, Government of India

सत्यमेव जयते

SPARC
Scheme for Promotion of Academic and Research Collaboration

National Coordinator

Presentation on the achievements of SPARC Phase-I projects: January 2024

Key Achievements: SPARC Phase-I projects

As per the information provided by the Project PIs till **the end of SPARC Phase-I projects**, the following achievements have been made:

- **Around 465 foreign faculty visits in India.**
- **Around 130 Indian faculty visits to abroad**.
- **Around 234 Indian student visits** abroad.
- **Around 43 foreign student visits to India**.
- **Around 383 workshops** organized either in-presence or via online-mode. More than 45,000 **students and scholars** attended those workshops.
- **Around 154 monographs** published.
- **More than 1060** tangible outcomes reported in forms of around **699 journal publications** and around **367** publications in **conference proceedings.**
- **Thirty (30) patents filed, Three patents granted**.
- **Around 30 product developments and 20 process developments** initiated.

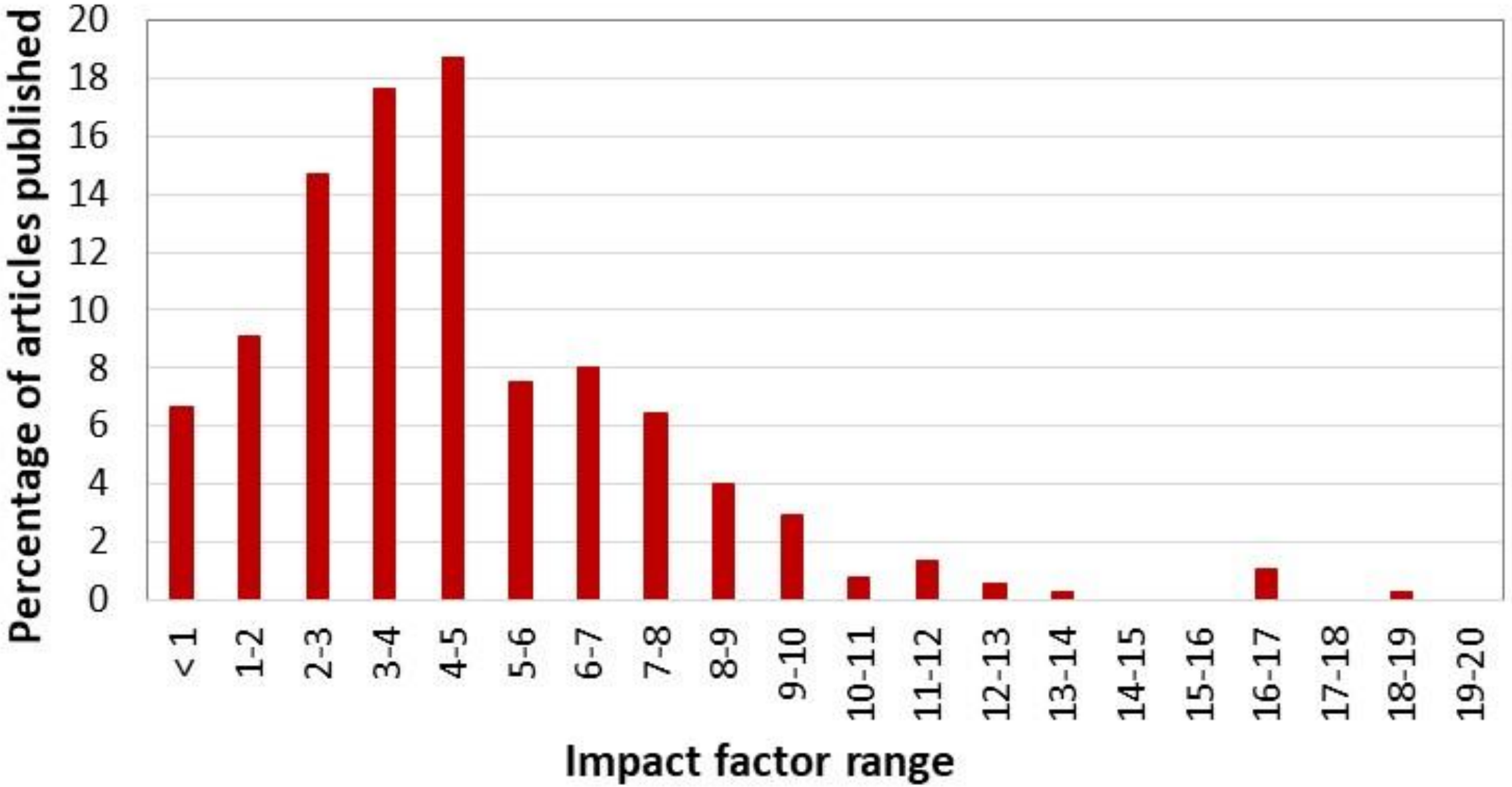
Some highly attended Webinars / Workshops organized from the SPARC Phase-I projects

Prj. Code	Attendees	Highly Attended Workshops: Title (Institutes)
1138	2568	SPARC-Indo-US Immunology Workshop **(IIT Ropar; GEORGE WASHINGTON UNIVERSITY, USA)**
1150	1902	Globalization and New Terrains of Consciousness: Phenomenologies of the Global/Local/Glocal **(Jamia Millia Islamia; JULIUS-MAXIMILIANS-UNIVERSITÄT WÜRZBURG, Germany)**
843	1540	Indo-US Webinar & Lecture Series on Advanced Functional Materials for Renewable Energy Application **(Jamia Millia Islamia; TEXAS A&M UNIVERSITY, USA)**
265	1473	Indo-US Workshop on Application of Data Science in Biological Systems **(IIT Kharagpur; ARIZONA STATE UNIVERSITY, USA)**
721	1000	Translational research in Neuroengineering and Neurorehabilitation **(IIT Gandhinagar; UNIV. AT BUFFALO SUNY, USA)**
957	877	Eye Tracking Technology in Dentistry **(Sri Ramachandra Inst. of Higher Education & Research; THE UNIV. OF WESTERN AUSTRALIA)**
988	638	3D Printed Auxetic Structures made of Soft and Hard Materials and its High Strain Rate Studies (Hybrid Mode) **(IIT Madras, SWINBURNE UNIVERSITY OF TECHNOLOGY, Australia)**
1108	600	Workshop on Energy Management in Smart Cities (EMSC-2021) **(Birla Inst. of Technol. & Science; CENTRALESUPÉLEC, France)**
807	500	Numerical and Experimental Modelling of Wave Structure interactions **(IIT Madras; UCL (UNIVERSITY COLLEGE LONDON, UK)**
1318	500	Workshop on Advanced Simulation Methods: DFT, MD and Beyond **(IIT Delhi; THE UNIV. OF QUEENSLAND, Australia)**
974	484	MHRD-SPARC supported International Online Faculty & Student Development Programme on Translational and Interdisciplinary research in human Diseases Management **(Sathyabama Inst. of Sci. and Technol.; NANYANG TECHNOL. UNIV. (NTU), Singapore)**
1000	450	India Mission for Green Hydrogen and Go-Electric (IIT Mandi; NORTHEASTERN UNIVERSITY, USA)
1207	403	International Virtual Short-Term Course on Futuristic Prospects of Geoenvironmental and Geotechnical Issues of Coal Mine Overburden and Mine Tailings **(IIT ISM Dhanbad; UNIV. OF ILLINOIS, CHICAGO (UIC), USA)**
468	398	Brain Inspired Computing, Brain Network Analysis and Post-Quantum Security (IIT Bhubaneswar; UNIVERSITY OF MINNESOTA, USA)
402	383	Indo-Korea Webinar - Advances in Biosensors **(Shanmugha Arts Sci.Technol.& Res.Academy; SUNGKYUNKWAN UNIV., South Korea)**
653	365	SPARC Indo-Australian Webinar Series on Emerging Trends in Financial Reporting **(Pondicherry Univ.; DEAKIN UNIV., Australia)**
981	350	Short Term Certificate Course cum Workshop "Fundamental of Social Design" Module-1 "Emerging of Design as Distinct Practice & Approaches and Paradigms of Design **(Banaras Hindu Univ.; MICHIGAN STATE UNIVERSITY, USA)**
1461	342	INDO-UK WORKSHOP "WATER POLLUTION AND RIVER DYNAMICS" **(Mahatma Gandhi University; UNIVERSITY OF LEICESTER, UK)**
657	334	SPARC Symposium on Transcriptional Dynamics in Developmental Biology **(Jawaharlal Nehru Univ.; THE UNIV. OF MANCHESTER, UK)**

Impact Factor of the articles published from SPARC Phase-I projects

699 journal articles published

Impact Factor of the articles published from SPARC Phase-I projects



List of ‘High Impact’ articles published from SPARC Phase-I projects

Research Area	Journal Name	Impact Factor
Advanced Functional and Meta Materials	**ACS NANO**	18.0
Future of Earth: Green and Renewable Technologies	**Chemical Engineering Journal**	16.7
Technologies for Rural and Women Empowerment	**Chemical Engineering Journal**	16.7
Design Innovation	**IEEE Transactions on Evolutionary Computation**	16.5
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Agricultural and Food Sustainability	**Environment International**	13.4
Technologies for Rural and Women Empowerment	**IEEE Wireless Communications Magazine**	12.8
Advanced Sensors, Electronics and Communication	**Nature NPJ Flexible Electronics**	12.0
Future of Earth: Green and Renewable Technologies	**Bioresource Technology**	11.9
Technologies for Forensics, Security and Safety	**IEEE Transactions on Industrial Informatics**	11.6
Advanced Functional and Meta Materials	**WIREs Computational Molecular Science**	18.0
Future of Earth: Green and Renewable Technologies	**Journal of Cleaner Production**	16.7
Future of Earth: Green and Renewable Technologies	**Journal of Cleaner Production**	16.7

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Research Area	Journal Name	Impact Factor
River, Ocean, Aviation and Space Management Technologies	**Science of The Total Environment)**	16.5
Artificial Intelligence and Cognitive Science	**ACM Transactions on Intelligent Systems and Technology (ACM TIST)**	16.5
Advanced Sensors, Electronics and Communication	**IEEE Internet of Things Magazine**	13.4
Design Innovation	**Green Chemistry**	12.8
Transportation and Smart Infrastructure	**IEEE Transactions on Intelligent Transportation Systems**	12.0
Advanced Sensors, Electronics and Communication	**IEEE Transactions on Intelligent Transportation Systems**	11.9
Advanced Functional and Meta Materials	**WIREs Computational Molecular Science**	11.5
Future of Earth: Green and Renewable Technologies	**Journal of Cleaner Production**	11.1
Future of Earth: Green and Renewable Technologies	**Journal of Cleaner Production**	11.1
River, Ocean, Aviation and Space Management Technologies	**Science of The Total Environment**	10.8
Artificial Intelligence and Cognitive Science	**ACM Transactions on Intelligent Systems and Technology (ACM TIST)**	10.5
Advanced Sensors, Electronics and Communication	**IEEE Internet of Things Magazine**	10.2

Details of the Important Patents Filed/Granted as per the information received from the PIs

1) Title: Microwave pyrolysis of non-edible cassia fistula seed pods over activated biochar for the production of bio-oil.

Inventors: Dr. Anand Ramanathan, M. Dineshkumar, Hrishikesh Babasaheb Gaikwad, (Proposal No. 965)

Granted on 10/04/2023. **Patent number:** 428613. **Patentee:** National Institute of Technology, Tiruchirappalli

2) Title: Microreactor with microheater for biodiesel production

Inventors: Dr. T. Vinoth, Mr. Gopi R, Dr. R. Anand.

Granted on 04/08/2023. Application No. 385558-001. **Patentee:** Dr. T. Vinoth, Mr. Gopi R, Dr. R. Anand

To facilitate the mass production of biodiesel, this patent offers the potential to scale up biodiesel production in India efficiently. This could lead to greater energy security, reduced imports of fossil fuels, and a more stable energy market

3) Title: Quartz Reactor Vessel

Inventors: Dr. Anand Ramanathan, M. Dineshkumar (Proposal No. 965)

Published on 17/02/2022 (Application No. 347130-001). **Patentee:** National Institute of Technology, Tiruchirappalli

4) Title: An Improved Method for Recycling Electronic Plastics Waste Using Bi-Metal Doped Catalyst

Inventors: Dr. Anand Ramanathan, Dineshkumar Muniyappan, Uthayakumar Azhagu (Proposal No. 965)

Published on 22/09/2023 (Application No. 202341058811). **Patentee:** National Institute of Technology, Tiruchirappalli

5) Title: Antifungal Compound, Composition And Uses Thereof

A coating formulation can also be applied to living and non-living substrates to prevent fungal infections.

Inventors: **NEELAKANTAN, Prasanna**; SOLOMON, Adline Princy & SHANMUGAM, Karthi

PCT **Application** No. PCT/IN2022/050932. Claiming Priority from Indian Application No. 202111018036. Filed on: April 19, 2021

Applicants: (i) Versitech Limited, (ii) SASTRA Deemed University.

Broad Area: (1-4) Future of Earth: Green and Renewable Technologies. UNIV. FEDERAL DO RIO DE JANEIRO, Brazil
(5) Infectious Diseases & Clinical Research. Univ. of Hong Kong.

Inventors (Institute)	Title of the Patent Applied (Research Area. Project Title)	Status as informed by PI
6) Chokkakula L.P. Pavithra, Kunda Siri Kiran Janardhana Reddy and Suhash Ranjan Dey **(IIT Hyderbad)**	**Electrochemical synthesis of nanocrystalline multicomponent alloy thin films/coatings in an aqueous medium.** (Area: Advanced Functional and Meta Materials. Project Title: Tuning the Magnetic properties of nanocrystalline multi-component alloy thin film coatings through a single step electrodeposition for sensor applications)	**Indian Patent Granted on 14-09/2023** (Patent No. 451603)
7) Rehan Deshmukh, Utpal Roy, and Sunil Bhand **(BITS Pilani)**	**Polynucleotide Sequence For The Detection Of Escherichia coli** (Area: Nano, Biotechnology and Applications. Project Title: Novel micro and nano sensors for antibiotic resistance measurement)	Date of Filing: 23-10-2020 Date of Publication: 29-04-2022 (Indian Patent Application: 202011046287)
8) Chokkakula L.P. Pavithra, Suhash Ranjan Dey and Kunda Siri Kiran Janardhana Reddy **(IIT Hyderabad)**	**High entropy alloy and quinary alloy nanowires.** (Area: Advanced Functional and Meta Materials. Project Title: Tuning the Magnetic properties of nanocrystalline multi-component alloy thin film coatings through a single step electrodeposition for sensor applications)	Indian Patent
9) **(IIT Madras)**	**Two stage Air gun system for bullet impact studies** (Area: Advanced Functional and Meta Materials. Project Title: Multiscale studies of Compression-after-impact in fiber reinforced composites.)	Indian patent
10) B MOHAMMED JAFFAR ALI, K VIGNESH, EMERSON ANDRADE SALES, RODRIGO GOMES GUIMARAES, DONATO A.G. ARANDA, R. ARUN PRASATH **(Pondicherry University)**	**A NOVEL ETHANOL PRODUCTION USING MICROALGAE BIOMASS AND SUGAR SUBSTRATE THROUGH BIO STIMULATION OF FERMENTATION PROCESS** (Area: Future of Earth: Green and Renewable Technologies. Project Title: NOVEL APPROACHES IN BIOFUEL PRODUCTION AND PROCESSING)	INDIAN PATENT

Inventors (Institute)	Title of the Patent Applied (Research Area. Project Title)	Status as informed by PI
11) Mr. Rohan Kaushal, Mr. Kush Dilip Acharya, Mr. Gorla Hema Vishal, Ms. Srimathi. C, Mr. Saleemdurai. M. A., Mr. Robin Ram Mohan Doss, Mr. Jayakumar S.K.V. **(Vellore Institute of Technology)**	**SELF DRIVING CAR IN SMART ENVIRONMENT** (Area: Future of Earth: Green and Renewable Technologies. Project Title: Enabling Smart and Safe Cities through IoT Technologies.)	Official journal of the patent office
12) B. Mitra, M. Singh, S. Sapra, P. Vinayak, M. Hassan **(IIT Delhi)**	**Nano Heterostructures of Transition Metal Dichalcogenide sensing film based extended gate field-effect transistor for the sensing of heavy metals** (Area: Advanced Sensors, Electronics and Communication. Project Title: Flexible and Disposable Heavy metal sensing patch for public health and regulatory applications)	Controller General of Patents, Designs & Trade Marks Intellectual Property India
13) K Krishna Reddy, P. Sreehari Rao, MV Krishna Reddy **(NIT Warangal)**	**A FLIPPED VOLTAGE FOLLOWER-BASED LOW DROP-OUT REGULATOR DEVICE** (Area: Advanced Sensors, Electronics and Communication. Project Title: Advanced CMOS clock recovery circuits for mobile applications)	AusPat
14) Krishna Prasath Logakannan, Velmurugan R, Jayaganthan R, Dong Ruan **(IIT Madras)**	**A novel hybrid tube with auxetic outer layer** (Area: Advanced Manufacturing. Project Title: High Strain Rate Studies of Additively Manufactured Aerospace Components)	Indian Patent

…. Thirty patents files in total, Three granted ….