



Science Summit at the 78 United Nation General Assembly (SSUNGA78)

CSIR's Science Sessions "CSIR, India: An Innovation Hub for Global Sustainable Development" Science Summit at the 77 United Nation General Assembly Date: 22 and 28 September 2023; Time: 1630 hrs to 1900 hrs (IST)

About the Organization: Council of Scientific and Industrial Research (CSIR), India

Council of Scientific & Industrial Research (CSIR), India, is the largest industrial R&D organization in India, under the Department of Scientific and Industrial Research (DSIR) of Ministry of Science and Technology, Government of India. CSIR, established in 1942 has 37 multidisciplinary R&D institutes located across India that are working in a wide spectrum of S&T fields from oceanography, geophysics, chemicals, drugs, genomics, biotechnology and nanotechnology to mining, aeronautics, instrumentation, environmental engineering and information technology. SCIMAGO Institutions Rakings 2022 has ranked CSIR, India **39th among 1745 Government institutions worldwide** with a **"Research" rank of 186 among the 8084 ranked institutions globally**. CSIR, India lies in the 4th percentile in Research ratings among with World institutions and lies in the **2nd percentile in Research rating among the institutions in Asiatic region**.

The Network of laboratories are being manned by about 9000 highly skilled S&T manpower. Its need-based and industry-focused R&D and technology development, strength in basic and applied research, and the world-class R&D infrastructure have contributed immensely to India's prowess in S&T as measured by patents, publications and innovations.

CSIR has been contributing immensely to the industrial, societal and economic development and growth of India for eight decades now. CSIR has helped India overcome many challenges and crisis, from promoting self-sufficiency in the face of technology denials, to handling natural disasters such as earthquakes, floods, pandemic, through appropriate technological solutions.

CSIR has developed "CSIR@80: Vision & Strategy 2022 – New CSIR for New India" which envisions pursuing science that strives for global impact, the technology that enables innovation-driven industry and nurtures trans-disciplinary leadership thereby catalyzing inclusive economic development for the people of India.

CSIR has been immensely contributing to the UN Sustainable Development Goals. The Session on "CSIR, India: An Innovation Hub for Global Sustainable Development" will briefly present these contributions. These can be viewed at

| Youtube | Facebook | Twitter |
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| https://www.youtube.com/csirindia1942 | CSIR, India Facebook | https://twitter.com/csir_ind?lang=en |





Science Summit at the 78 United Nation General Assembly (SSUNGA78)

PROGRAM

| Day 1: 22 September 2023; Time: 16:30 hrs to 19:00 hrs (IST) Register : <u>https://sched.co/1POx4</u> | | | | | | | | | |
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| Theme/Title | Topic & Speaker | Time, hrs | About the talk | Photograph of the speaker | Profile of the Speaker | Email of the speaker | | | |
| Inaugural | Welcome and Introduction to the meeting Dr Rama Swami Bansal, Head, ISTAD, CSIR | 1630 | Welcome and Introduction to the scientific meeting titled "CSIR, India: An Innovation Hub for Global Sustainable Development". | | Dr Rama Swami Bansal joined the Council of Scientific & Industrial Research (CSIR), Ministry of Science & Technology, Government of India in 1997. She is the Head of the International S&T Affairs Directorate (ISTAD) of the CSIR. She has been fostering S&T Cooperation of CSIR institutes with their partners abroad and has successfully launched several cooperation programmes. Dr Bansal is assisting Director General of CSIR in promoting specific international networking. She has a rich experience of nearly 30 years in management of International S&T Cooperation and Coordination of International Bilateral and Multilateral programmes. earlier at Department of Science & Technology, in CSIR and also as an S&T Counselor and Head of the Science & Technology Wing of the Embassy of India in Moscow, Russia during June 2011 to June 2015. | <u>rsb@csir.res</u> <u>.in</u> | | | |
| Session | Overview of CSIR Dr N. Kalaiselvi, Director General, CSIR | 1635 | Inaugurating the meeting and sharing an Overview of CSIR to kick-start the deliberations. Good practices and Unique models of CSIR (Presence of CSIR on World map, TRL Assessment and human resource developed by CSIR may be covered)? | | Dr (Mrs) N. Kalaiselvi assumed charge as Secretary, DSIR and Director General, CSIR, New Delhi on August 8, 2022. Dr. Kalaiselvi is the first women Director General of CSIR. Prior to taking over as Secretary, DSIR and DG, CSIR, she was working as Director, CSIR-Central Electrochemical Research Institute, Karaikudi. Dr Kalaiselvi (born: February 5, 1967) obtained bachelor's degree in Chemistry from Government Arts College Tirunelveli, obtained her Post Graduate Degree in Chemistry from Government Arts College Coimbatore and did her PhD at Annamalai University, Chidambaram. Dr. Kalaiselvi's research work of more than 25 years is primarily focused on electrochemical power systems and in particular, development of electrode materials, custom designed synthesis methods. optimization of reaction parameters and | <u>dg@csir.res.</u> <u>in</u> | | | |



Science Summit at the 78 United Nation General Assembly (SSUNGA78)



electrochemical evaluation of in-house prepared electrode materials for their suitability in energy storage device assembly. Dr. Kalaiselvi has served as Nodal Scientist for project MULTIFUN [Multifunctional Electrodes and Electrolytes for Futuristic Technologies, sponsored by CSIR]. She played instrumental role in implementation of e-mobility in India. Dr. Kalaiselvi has more than 135 research papers and 6 patents to her credit. She is recipient of many prestigious awards including Most Inspiring Women Scientist Award.

Day 1: Scientific Session on "Sustainable Utilization of Resources": 1640 hrs -1900 hrs

Session 1 - Green Energy and Mobility (SDG 7 - Affordable & Clean Energy; SDG 8 – Decent Work & Economic Growth and SDG 13 – Climate Action)

Chair - Dr Ashish Lele, Director, CSIR-NCL; Co-Chair - Dr K Ramesha, Director, CSIR-CECRI

| Overview of the Session | Dr Ashish Lele, Director, CSIR- NCL | 1640 | India has launched a National Hydrogen Mission and CSIR is working on Green Hydrogen Mission which is complementing the National Mission. In this talk I will highlight a few of CSIR's success stories in developing indigenous, globally benchmarked and competitive technologies in collaboration with Indian industry partners. KPIT partnered with NCL | Dr. Ashish Lele, took over the charge as the Director of CSIR- National Chemical Laboratory, Pune on April 2022. Initially Dr. Lele was Senior VP & amp; Head, Advanced Materials and Alternative Energy Group at Reliance Industries Ltd. Dr. Lele completed his Chemical Engineering graduation from the Department of Chemical Technology (ICT), University of Bombay, in 1988. He obtained Ph.D. in Chemical Engineering from the University of Delaware, USA in 1993. He joined CSIR- NCL in 1993 as a scientist and set up a research group on the rheology of complex fluids, polymer dynamics, and polymer processing. He led many industry-sponsored research projects at the laboratory and carried out several product development activities. He led the efforts for developing PEM fuel cell technology in a consortium of three other CSIR laboratories and three Indian industries. Dr. Lele has authored 75 research papers in international peer- reviewed journals and 6 patents. He has supervised 17 Ph.D. theses. Dr. Lele has been the recipient of the Shanti Swaroop Bhatnagar Award in Engineering Sciences in 2006, Infosys prize in Engineering and Computer Science in 2012 and, the ICT Distinguished Alumnus award in 2013. Other recognitions | ak.lele@nc l.res.in; director@n cl.res.in |
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| | | | | include CSIR Young Scientist Award (1994), INSA Young Scientist Award (1996), ICT Young Scientist Award (2003). He is a fellow Indian National Science Academy, Indian Academy of Sciences, and Indian National Academy of Engineering. | |
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| | Dr K Ramesha, Director, CSIR- CECRI | 1643 | | Dr. K. Ramesha assumed charge as Director, CSIR-Central Electrochemical Research Institute (CSIR-CECRI), Karaikudi on April 29, 2023. CSIR-CECRI is the largest institute in South Asia dedicated to research and innovations in electrochemical science and technologies. CSIR-CECRI founded on July 25, 1948under the aegis of the Council of Scientific and Industrial Research (CSIR), New Delhi and its unique capabilities are in the research areas of Corrosion and Material Protection, Electrochemical Power Sources, Electrochemical Process Engineering, Electrodics & Electro-Catalysis, Electro-Organic & Materials Electrochemistry, and Electroplating & Metal Finishing. Dr. Ramesha's areas of specialization are materials for energy storage, particularly for Li-ion batteries and other futuristic energy storage devices such as Na-ion, Li-S, Li-Air, and all-solid-state batteries. | director@ce cri.res.in; ramesha@c ecri.res.in |
| Strengthening R&D Ecosystem to meet India's Green H2 Ambitions | Dr Chinnakonda S Gopinath, Outstanding Scientist, CSIR- NCL | 1645 | Green hydrogen mission/policy announcements by many nations around the world underlines the real change is to come soon. Although the current green hydrogen price is high, what are the ways to make it affordable is a big question. How the R&D ecosystem to evolve to meet those challenges to be discussed. Translation of research findings to mature technology through technology translation centers to be a potential route to quickly scale-up hydrogen with speed. From CSIR, hydrogen technology (H2T) program has been initiated; I will also highlight some of the important activities and the RI&D activities that are in pipeline. | Dr Chinnakonda Gopinath (Gopi) is currently working as Outstanding Scientist at the National Chemical Laboratory (NCL), Pune. His research interests include surface science, heterogeneous catalysis, and solar to chemical energy conversion. He has published 240 research articles and ten patents with special emphasis on catalytic and solar to chemical energy conversion aspects. Gopi is actively engaged in hydrogen economy aspects, and leading the hydrogen technology (H2T) program of CSIR. Fifteen different CSIR laboratories are participating in H2T program across the entire value chain of hydrogen. His group actively works in the area of water splitting and artificial photosynthesis in direct sunlight by photocatalysis. | cs.gopinath @ncl.res.in |



CSIR, India: An Innovation Hub for Global Sustainable Development Science Summit at the 78 United Nation General Assembly (SSUNGA78)



Powering the Future: A Comprehensive Update on the Development Status of CSIR Battery Technologies

Dr AS Prakash, Senior Principal Scientist, CSIR-Central Electrochemical Research Institute, CSIR-Madras

Complex

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Ever increasing fuel prices and environmental concerns are urging the Indian consumers to shift to EV technology. In the development of EV technology, battery becomes the most important component. The EV performance and cost greatly depend on the battery technology and hence research and development of Li-ion and next generation batteries and their components such as electrodes, become most crucial for driving EV affordable for mass adoption. It is understood the Li-ion battery manufacturing in India will drive the quicker adoption of EVs and renewable energy storage in India. Moreover, it is expected that locally manufactured batteries can be customized for Indian weather optimal conditions for performance. Understanding the importance, CSIR has installed pilot scale facility for Li-ion/Na-ion batteries and Supcapacitors production at CECRI, one of its laboratories which is well known for R & D activities in the area of electrochemistry and energy storage. CSIR-CECRI has been working towards translating the R & D innovations and IPR generated in the area of Li-ion. Na-ion and next generation batteries to pilot level manufacturing and work with Indian industries. In order to reduce the dependency on imports of battery components and supply chain, India needs to achieve the similar level of performance at the component level and CSIR achievements in these areas are highlighted in this talk. This talk focuses on the R & D efforts towards developing the indigenous battery technologies and its subcomponents to set up a long term sustainable ecosystem by linking supply chain and manufacturing.



Dr. A S Prakash obtained his M.Sc degree in Chemistry (1995) from university of Mysore, India. He received Ph.D degree from Mangalore University in 2003. He also worked as a Research fellow and Research Associate at solid state and structural chemistry unit, Indian Institute of Science, Bangalore during 1997 to 2003. After his Ph.D degree, he Joined Professor Jean Marie Tarascon at "Laboratoire de Réactivité et de Chimie Des Solides", CNRS, France as post-doctoral researcher from 2003-2005. After his post doc, he joined CSIR lab "Central Electrochemical Research Institute", Karaikudi as Scientist in 2006. He moved to Central Electrochemical Research Institute-Chennai Centre in 2008.

He is also a faculty member since 2011 as Professor at Academy of Scientific and Innovative Research (AcSIR). Dr Prakash is a visting professor at University of Picardie in France and also at College De France, Paris, France. He is a visiting scientist to Fraunhofer Institute for Advanced Manufacturing, Germany. He is involved in several research training programmes and coordinated/actively participated in Science Outreach activities. He is a member of professional bodies like IUMRS, Electrochemical Society. He is a Vice President of "The Society for Advancement of Electrochemical Science and Technology (SAEST).

Currently, he is leading a research group on electrochemical energy storage, especially on Li-ion batteries and super capacitors. His research interest are in the area of materials synthesis, designing new materials, characterization techniques and correlation of structure-property relationship. His Li-ion battery research covers fundamental understanding at materials level to high end applications like electric vehicle application. Presently at CECRI, handling few important projects of national importance and also consultancy projects from multinational and Indian industries. Published more than 60 research papers in reputed international science journals and he has filled about 10 patents in the fileld of rechrgeable batteries India and abroad.





| Enabling India's Path to Self-Reliance in Photovoltaics through Advancements in Molecular Light Harvesting Technologies Pioneered at CSIR | Dr Suraj Soman, Scientist, CSIR- NIIST | 1659 | The presentation will highlight India's pursuit of self-reliance in various light harvesting technologies underscored by advancements notably in the domain of dye-sensitized and perovskite solar cells. CSIR envisions the development of efficient indigenous solar cells leading to import substitution, and facilitating a robust supply chain. By nurturing capabilities in the upcoming areas of photovoltaics, CSIR strives to establish a formidable position in the global solar energy landscape, aligning technological progress with national aspirations for self-reliance. By nurturing capabilities in these key upcoming areas, conducted at CSIR, underscores the nation's commitment to sustainable energy solutions, propelling India towards self-sufficiency in emerging photovoltaic sectors. | Dr. Suraj, Scientist at CSIR-NIIST, holds a Ph.D. from Dublin City University, Ireland and pursued post-doctoral research at institutions like Caltech and Michigan State University, USA. Currently a Scientist at the Centre for Sustainable Energy Technologies, NIIST, his outstanding achievements include the Solar Challenge Award, CSIR Young Scientist Award, and INSA Medal for Young Scientist. Dr. Suraj's pioneering work revolves around innovative molecular photovoltaic technologies for indoor photovoltaics. He notably led the establishment of India's first indigenous module fabrication line for indoor dye-sensitized solar modules. His visionary team employs creative approaches to bridge laboratory discoveries with market-ready solutions, promising a brighter, sustainable future. | suraj@niist.r es.in |
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| Electric Aircraft of CSIR-NAL | Dr Achuthan C. Pankaj, Principal Scientist, CSIR- NAL | 1706 | The presentation delves into the transformation of the fuel-driven HANSA 3 (NG) aircraft into an all-electric version, Electric Hansa – NG. The focus is on maintaining a consistent 750 kg take-off weight. The process involves intricate calculations and methodologies to replace the fuel-based engine, its components, and fuel with equivalent battery systems. This results in insights into the new aircraft's performance metrics such as endurance and range. Additionally, the study explores the potential of a hybrid electric model, substituting the internal combustion engine with a combination of battery, fuel cell, hydrogen storage, and associated power elements, thereby estimating its endurance and range. | Dr Achuthan C. Pankaj is a Senior Principal Scientist at CSIR- National Aerospace Laboratories (CSIR-NAL). Holding a Ph.D. from NITK, Surathkal in Statistical Energy Analysis. He specializes in Structural Dynamics, Aeroelasticity, and Aircraft Systems Reliability. With significant contributions to national aircraft programs, strategic sectors, and R&D projects, he's garnered awards and accolades for his accomplishments. Graduating with BE and ME degrees in mechanical engineering from Pune University and NIT Allahabad respectively, Dr. Pankaj has published articles on Design, Aeroelasticity and Reliability. He has actively contributed to several notable aircraft projects in the above -mentioned areas, including SARAS, HANSA, LCA (Light Combat Aircraft), MIRAGE, AMCA (Advanced Medium Combat Aircraft), and RLV (Reusable Launch Vehicle). | acpankaj@n al.res.in |





Science Summit at the 78 United Nation General Assembly (SSUNGA78)

| Hydrogen for mobility and beyond Gujarathi, KPIT Ltd. | 1713 | Several nations around the globe have set ambitious decarbonization and emission reduction targets. Hydrogen has emerged as a potential contender in fulfilling these targets. The development of hydrogen fuel cell technology and scaling it up for mass adoption is a complex challenge. The technology involves multiple disciplines ranging from material science, systems engineering, manufacturing processes to innovative revenue models. All these capabilities are hard to find within a single organization. Development can be accelerated with by forming alliances between various partners with synergistic capabilities. In one such example, KPIT has partnered with CSIR labs to take core technology from the lab, apply engineering principles to come up with very efficient, durable, and economically viable solutions. The talk will cover KPIT's journey in Hydrogen Fuel Cell technology. It will also highlight various projects that KPIT has undertaken in automotive, marine, and power back up applications. | | Deepesh Gujarathi is an "Instrumentation and Controls" engineer by education and has worked in the semiconductor, solar DC microgrids and Hydrogen industry with a total experience of 25 years. As a Principal Architect at KPIT he is responsible for Hydrogen Fuel Cell Technology since its inception 7 years ago. Supported by a passionate team of engineers and scientists and a visionary management, he has been able to build Hydrogen Fuel Cell technology from the very ground up. He believes that the climate change is an unprecedented and real crisis but at the same time he is optimistic that with enough determination it can be overcome. | Deepesh.Gu jarathi@kpit. com |
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| Discussions & Q&A | 1718 | | | | |
| Soccion 2 Chamicals (Bulk and | 1 Snoc | vialty) and Sustainable Materials (S | CG 0 Inductory In | provation & Infractructure and SDG 11 | |

Session 2 - Chemicals (Bulk and Specialty) and Sustainable Materials (SDG 9 – Industry, Innovation & Infrastructure and SDG 11 – Sustainable Cities and Communities) Chair - Prof Pradeep K Ramancharla; Co-Chair - Dr D. Srinivasa Reddy, Director, CSIR-IICT



Science Summit at the 78 United Nation General Assembly (SSUNGA78)



| Overview of the Session | Prof. Pradeep Kumar Ramancharla, Director, CSIR-CBRI | 1725 | | Prof Ramancharla Pradeep Kumar, Director, CSIR-CBRI. Did BTech in 1995 from Vasavi College of Engineering, MTech in 1997 from IIT Kanpur and PhD in 2001 from The University of Tokyo. He is a structural engineer with 20+ years of experience in teaching and research. His areas of specialisation are non- linear behaviour of structures and earthquake safety assessment of buildings. Guided the doctoral thesis of 13 students and published 120 Journal papers. His notable contributions are 1) Establishing Earthquake Engineering Research Centre (EERC), 2) Stated an MTech program in Computer Aided Structural Engineering (CASE), 3) National report on Earthquake Disaster Risk Indexing of Cities/Towns, 4) A Primer on Rapid Visual Survey (RVS), 5) Passionate contribution towards Universal Human Values in Academic Institutions. He is currently a BIS panel member of IS 456 & IS 1343, Earthquake Engineering Sectional Committee, National Building Code and IRC bridge standards & specification committee. | director@cb ri.res.in |
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| | Dr. D. Srinivasa Reddy, Director, CSIR-IICT | 1728 | | Dr. D. Srinivasa Reddy, Director of CSIR-Indian Institute of Chemical Technology (CSIR-IICT) based in southern Indian city Hyderabad. He was trained as an organic chemist and gained experience in medicinal chemistry and drug discovery from pharmaceutical industry. Dr. Reddy is best known for his application oriented organic synthesis towards human wellbeing. His research interests are on total synthesis of biologically active natural products and medicinal chemistry using "silicon incorporation approach". His research group at CSIR-NCL Pune accomplished total synthesis of more than 35 natural products with impressive biological properties. His group developed a cost-effective process route for drugs Ivacaftor (cystic fibrosis) and Lifitegrast (ophthalmic). One of the molecules (Licogliflozin) discovered by his team in industry is currently undergoing human clinical trials (Phase-II). Dr. Reddy is an author of >120 publications and an inventor in more than 35 patents. Over all, he brings experiences from both pharmaceutical industry and Govt national laboratories. | <u>director@iict</u> <u>.res.in</u> |





| CSIR catalysing the journey of India as the next chemical manufacturing hub | Dr. K.J. Sreeram, Director, CSIR-CLRI | 1730 | CSIR has built the necessary core competence, intellectual range, infrastructure, and an established network of sister laboratories to assess, develop and translate technologies relevant to the Indian Chemical Sector. Providing indigenous specialty chemicals and customized agro and pharma products to a market where agility to technology changes and consumer demands is the key. The thematic grouping of CSIR laboratories, wherein one of the themes is Chemicals (including leather) and Petrochemicals (CLP), has led to diversified yet concerted R&D based on specific industrial needs. The success of the technology translation from the CLP group of laboratories is a strong academy – research – industry partnership. For the last 8 decades some of the Government owned industries are grown out of technologies developed from CSIR. This includes those on insecticides, leather chemicals, catalysis, petrochemicals and so on. In this presentation we will provide a glimpse of our journey from mind to market chain in the Chemical sector. Our commitment to sustainability (environmental, economic and social) has led to industrial growth where India has established a trade of USD 170-180 billion (2021). | A leather technologist by training, Dr KJ Sreeram specialises in sustainable manufacturing and alignment of leather industry to SDG. He is currently the Director of CSIR-CLRI with additional charge of CSIR-CECRI. He is also theme Director of CSIR-Chemicals (including leather) and Petrochemicals. Dr Sreeram has made important contributions to the Green Chemistry of Chromium, that has opened up new paths for better industrial management of this metal ion at the global level. These contributions have led to his becoming the first researcher with a degree in leather technology from Anna University to receive the CSIR Young Scientist Award in 2004. Dr Sreeram has also contributed immensely to the development of environmentally benign and cool pigments from rare earth metal ions, as a replacement to the pigments based on toxic metal ions such as chromium, lead, mercury etc. He is also credited with commercially successful technologies for the avoidance of formaldehyde in tanning agents. During the last five years, in order to exploit the advantages of nanoscience for developing materials with unique applications, Dr Sreeram has developed a range of functionalized metal and metal oxide nanoparticles with potential applications in crosslinking of proteins, a work which led his being recognized by the International Union of Leather Technologists and Chemists Societies, with the International Union of Research Award. In his role as the Director of CSIR-CLRI, he is also the Chairman of the CHD-17 of the Bureau of Indian Standards and member of the Council of Administration, SITRA Coimbatore and the Governing Council of FDDI. | kjsreeram@ clri.res.in |
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| Sustainability in Construction - Approaches to address the Known Challenges | Dr. N. Anandavalli, Director, CSIR-SERC | 1740 | Buildings and infrastructures demand state of the art technical qualities which should provide good structural health, early warning for any abnormality and long lifetime. Construction by its nature is one of the top users of natural resources. Developments and demands in civil and infrastructure sector pose big challenges in terms of depleting natural resources such | Dr. N. Anandavalli is presently the Director, CSIR - Structural Engineering Research Centre, Chennai. She completed her graduation from University of Madras in 1991 with University first rank and won "The Rao Bahadur S.Subbarayachariyar Gold Medal". She received Ministry of Human Resources Scholarship for pursuing her post graduate studies at PSG College of Technology, Coimbatore (1991-1993), where she was ranked first. She received the CSIR-JRF and SRF fellowship during 1993 - 1996. After working for a brief period | <u>director@se</u> rc.res.in |





Science Summit at the 78 United Nation General Assembly (SSUNGA78)

as sand, cement and metals. Globally, huge quantity of greenhouse gases generated by the human involvement, thus lot of sun radiation absorbed by earth surface which transfer in the increase in temperature. Major industries like chemicals, steel and cement consume 60% of Industrial energy and generate 70% of CO2 emission. Cement industry contributes to 5–8% of the global greenhouse gas emissions. For the achievement of Net Zero Emissions (NZE) by 2030, the greenhouse gases emission reduction technologies which under development today are useful.

In all stages of construction, viz., feasibility, design, construction, operation and demolition, sustainability should be the first priority. Current approach of considering cost and aesthetics in selection of building materials has to be rethought towards environmental impact of the materials chosen for construction. Throughout the design life, renovation remains. Life Cycle Approach needs to be adopted before selection of any material for construction. New technologies that conserve nature to be embraced and regulatory authorities facilitate such technologies to be implemented. Depletion of natural resources on construction materials and disposal of construction waste are two big issues that need to be addressed. Addressing this, it is essential to focus on development of new construction materials that can substitute the natural resources and also development of construction

in design consultancy firms, she joined CSIR-SERC as Scientist in 1998.

Her research interests include blast response behaviour of structures, computational methods, sustainable materials and multi-scale modelling of composite materials.

She has one US patent and Indian patent granted on 'Laced Composite System' based on her work. She is Member of BIS committee - CED 39 - 39.2 (sub) - Blast Resistant Design of Structures and BIS committee - CED 38 Special Structures Sectional Committee. She has mentored many graduate and post-graduate students from various engineering colleges and universities. She is guiding few Ph. D. students for their doctoral work.

In addition to her role as Director, CSIR-SERC, she is the coordinating director for CSIR Madras Complex consisting of regional units of 5 CSIR laboratories. She is also leading the Civil, Infrastructure and Engineering Theme of CSIR as the Theme Director and functioning as the Director of Engineering Coordination of CSIR. She has been nominated as a member to the Planning Board of Bharathidasan University and Syndicate member of Madras University.



Science Summit at the 78 United Nation General Assembly (SSUNGA78)

12-29 September 202







Science Summit at the 78 United Nation General Assembly (SSUNGA78)

| | | design methods, referring to existing codes & standards, technology, and solutions, there will be an anticipated peak demand of 150GW (30% of global peak demand) in 2030. Thus it is essential to reduce the energy consumption to the levels less than the current level by building the climate resilient cities and communities. The presentation will focus on the urban climate policies, nature based solutions and ecosystem restoration in urban climate risk mitigation. | extensively consulted for several national and international organizations in the area of disaster risk reduction and recovery. | |
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| Discussions & Q&A | 1800 | | | |

Session 3 - Explorations and Sustainable Unearthing of Treasures (SDG 13 – Climate Action; SDG 14 – Life Below Water and SDG 15 – Life on Land)

Chair - Dr Atul Narayan Vaidya; Co-Chair - Dr Prakash Kumar, Director, CSIR-NGRI

Overview of the Session

Dr Atul Narayan Vaidya, 1810 Director, CSIR-NEERI



Dr. Atul Vaidya did B. Tech. in Chemical Engineering from director@ne Laxminarayan Institute of Technology (LIT), Nagpur and M. eri.res.in; Tech. in Chemical Engineering from IIT-Bombay. He obtained Ph.D. in Chemical Engineering from RTM Nagpur University. At present, Dr. Vaidya is Director of the CSIR-National Environmental Engineering Research Institute (CSIR-NEERI). Earlier, he was Chief Scientist and Head of Chemical and Hazardous Waste Management Division, CSIR-NEERI, He has over 34 years of research experience in environmental science and engineering, especially in waste management. Dr. Vaidya has extensively worked on various aspects of waste management, including characterization, treatment, reuse and recycle, impacts on the environment, Green House Gas (GHG) emissions and environmentally sound practices, such as waste minimization, clean technology, circular economy. He is also actively working for Stockholm convention, UNFCCC and Minimata convention. He also has experience in biotechnology and technology demonstration. He has implemented effective technological options for environmentally sound management of hazardous wastes at various industries in the country. Dr.



Science Summit at the 78 United Nation General Assembly (SSUNGA78)



| | | Vaidya has facilitated decision-making across the country through his basic and translational interdisciplinary research on various environmental issues. His contributions in national and international environmental policies have been noteworthy. He has published many research papers in national and international journals. | |
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| Dr Prakash Kumar, Director, CSIR-NGRI | 1813 | Dr. Prakash Kumar is currently serving as Director of CSIR- National Geophysical Research Institute. He received his M.Sc (Tech) from the Indian School of Mines, Dhanbad and PhD degree from Osmania University, Hyderabad in Geophysics. He is the recipient of various awards and recognitions such as CSIR- Young scientist award, Krishnan Gold medal from Indian Geophysical Union, National Geoscience Award, Anni Talwani Memorial Prize. He was the visiting researcher at GeoForschungsZentrum (Germany), Earthquake Research Institute (University of Tokyo, Japan), IPGP (Paris) and Institute of Physics of the Earth (RAS, Moscow). Dr. Kumar published 65 research papers in peer-reviewed journals including Nature, Science, Nature Geoscience and PINAS. He has supervised 5 PhD thesis and served as member in various international and national committees. He has also co-authored one book. Dr. Kumar's research areas include both active and passive seismology. His interest comprises of theoretical and computational seismology: Converted wave techniques, Anisotropy, Seismological Tools to explore deep earth and attempting forefront problems in seismology and Earthquake source dynamics. His most notable work is the mapping of the Lithosphere-Asthenosphere Boundary using converted waves (P- and S-receiver functions) in diverse geodynamical regimes. His most important contribution is the estimation of thickness of plates of various Gondwana fragments and ocean Islands. He extensively worked on the seismological data from western to eastern Himalaya and Tibet. He has experience of using converted wave technique to the data from borehole broad band ocean bottom observatories (Pacific and Philippine Sea plates). Another notable work is the mapping of the oceanic plates using the land-based stations and suggested the seismic evidence for | direct ri.res. |

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| | | | | sharp oceanic plate which grows with age favouring predominantly thermal evolution of oceanic lithosphere. | |
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| Land Reclamation through Remediation | Dr MP Patil, Chief Scientist, CSIR-NEERI | 1815 | A huge quantity of solid and hazardous wastes is generated during manufacturing of various industrial products. These wastes contain significant concentrations of various hazardous constituents and pose serious environmental threats, if these are not managed in an environmentally sound manner. However, due to lack of awareness and infrastructure, the unscientific disposal of solid and hazardous wastes during 1960s to 2000 have resulted in a number of contaminated sites. It is estimated that there are approximately 300 hazardous waste contaminated sites contributing to widespread contamination of land, groundwater and surface water resources. This presentation will highlight the environmental challenges associated with such contaminated sites and the approach needed for their reclamation through remediation. | Dr Mahendra Patil has obtained his Ph.D. in Chemical Engineering and is presently working as Chief Scientist at CSIR-National Environmental Engineering Research Institute (CSIR-NEERI), Nagpur. He has more than 33 years' experience on various aspects of solid and hazardous waste management. This includes legislations, waste characterization, reuse/recycle, waste minimization, treatment, disposal, assessment and remediation of waste contaminated sites. He has developed many technologies/processes know- how for management of wastes for a number of industry sectors. He has been assisting various regulatory agencies such as the Ministry of Forests & Climate Change, Central Pollution Control Board, and State Pollution Control Board on various assignments related to solid and hazardous waste management. | mp_patil@n eeri.res.in |
| Sustainable utilization of marine living resources | Dr Narsinh L. Thakur, Senior Principal Scientist, CSIR-NIO | 1825 | The marine living resources represent biological component of our Oceans, which cover all organisms ranging from microscopic to giant fish and mammals. These resources are being utilized by human beings for food, feed, bio-based products and bioenergy. The marine living resources are vital components of human life, and they have great economic, social, and ecological value. As these living resources are renewable, there is certainly a need to use these resources in a sustainable manner. This presentation will highlight the various uses of marine living resources and recommendations for their sustainable utilization. | Dr Narsinh L. Thakur has more than 20 years of research experience in the field of marine biology & biotechnology. Though he is a marine biologist by training, he has developed lot many skills like formulation of multidisciplinary research projects by building a team, securing research grants, managing mega projects, result interpretation and dissemination of research output through publications and presentations. Fundamental research in the field of Oceanography inspires him to take any bright idea ahead for technology development & commercialization. Presently he is leading Marine Living Resources sub-vertical of "Ecology, Environment, Earth & Ocean Sciences and Water" (E3OW) theme of CSIR. | thakurn@ni o.org |





| Exploitation of Deep Mineral Resources – Opportunities and Challenges | Dr. Chandrani Prasad Verma, Senior Principal Scientist, CSIR-CIMFR | 1835 | Deep ore recovery has become inevitable to cope with industry requirements. Deposits occurring at great depth becomes usually unviable when open pit depth reaches 300 - 400 m and exploiting rest of the ore deposit by underground mining below an existing open pit poses many challenges. Stable crown pillar, stope sequencing, size of individual stope, orientation of in-situ stress, method of stoping are a few parameters that needs to be well thought of through detailed analysis by Numerical Modeling. CSIR-CIMFR has activated design of mentioned parameters in most of the Indian metal mines operating at greater depth of 400 – 1000 m. The presentation will highlight the importance of parameters in effective exploitation of deposit below an open pit through a case study and the challenges faced. | Dr. Chandrani Prasad Verma is currently working as Sr. Principal Scientist in CSIR-CIMFR, Nagpur. She holds Ph. D degree in Mining Engineering and is Principal Investigator in S&T project on development of Crown Pillar Design Guidelines for Indian Mining Scenario. She worked in Prestigious S&T project on Highwall Mining Technology that established the system in India and was her PhD topic. She has more than 19 yrs experience in the field of Rock Mechanics and Numerical Modelling with special reference to application of Numerical Modeling in Mine Design in coal as well as metal mine sector. Her research interest includes stability analysis of underground structure, pillar design, stope design, support design, web pillar design in highwall mining, etc., She has published more than 50 Technical Papers in various National and International Journals and delivered 16 Technical lectures at various Institutes of repute. Received CSIR Technology Award under the category of Physical Sciences including Engineering for "Developing the Technology for extraction design of locked-up coal by highwall mining in India" as Team member. Recipient of "FIRST LADY AWARD" from the hands of Honourable President of India Sri. Ram Kovind on 20-01-2018 at Rashtrapati Bhawan organized by Ministry of Women and Child Development, Govt. of India. She is Chairman of Curriculum Revision and Development committee for "Diploma in Mining & Mine Surveying" course of MSBTE. | chandrani@ cimfr.nic.in |
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| Harnessing the potential of mine water for a sustainable future | Dr. Pallabi Das, Senior Scientist, Department of Water Resource Management, CSIR- CIMFR | 1843 | Open cast and underground mining generate huge quantity of groundwater that needs to be pumped out. Mine water is a resource that can be tapped to meet water needs of millions. However, physico-chemical properties of mine water vary widely with contaminants like heavy metals, microbes, diverse cations and anions. In some cases, high sulfate content causes the water to become acidic with pH falling below 2. CSIR has worked on all such challenges. Three CSIR laboratories joined hand to convert mine water into drinking water which is helping the | Dr. Pallabi Das has over 7 years of research experience in minewater treatment, novel separation processes and process development. She has received SERB-SIRE fellowship for research visit in University of Connecticut, USA. She has led a research projects funded by Ministry of Steel, DST, Meghalaya State Pollution Control Board which has yielded a number of process prototypes, high impact factor publications, design copyrights and patents. Her research has fetched best presentation awards at occasions like Indo-French Summit on clean energy technologies, Indian International Science Festival among others. She is the recipient of institute gold medal, NIT Durgapur for toping the M.tech course in Chemical | pallabidas@ cimfr.nic.in |





Science Summit at the 78 United Nation General Assembly (SSUNGA78)

| | | people in the water stressed Jharia coalfield. CSIR has also taken up the difficult challenge of remediation of acid mine water in north eastern India. The talk will focus on some challenging success stories and touch upon the some of the research endeavours of CSIR to mitigate mine water in a sustainable manner. This also includes interesting recent initiatives like recovery of rare earths from acid mine water. | Engineering. | |
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| Discussions & Q&A | 1850 | | | |
| Vote of Thanks Dr Yatendra K. Satija, Scientist, ISTAD, CSIR | 1858 | Formal Vote of Thanks to the Speakers and Audience would be presented | | yksatija@csi r.res.in |

Day 2: 28 September 2023; Time: 16:30 hrs to 19:00 hrs (IST) Register : https://sched.co/1POxB

Day 2: Scientific Session on "Societal and Rural Development: Efforts of CSIR": 1630 hrs -1900 hrs

| Title | Speaker | Time, hrs | About the talk | Photograph of the speaker | Profile of the Speaker | Email of the speaker |
|---|---|--------------|---|---------------------------|--|----------------------|
| Welcome and introduction to the Day 2: Scientific Sessions | Dr Rama Swami Bansal, Head, ISTAD, CSIR | 1630 | Welcome and Introduction to the Day 2 of scientific sessions titled "CSIR, India: An Innovation Hub for Global Sustainable Development". | | Dr Rama Swami Bansal joined the Council of Scientific & Industrial Research (CSIR), Ministry of Science & Technology, Government of India in 1997. She is the Head of the International S&T Affairs Directorate (ISTAD) of the CSIR. She has been fostering S&T Cooperation of CSIR institutes with their partners abroad and has successfully launched several cooperation programmes. Dr Bansal is assisting Director General of CSIR in promoting specific international networking. She has a rich experience of nearly 30 years in management of International S&T Cooperation and Coordination of International Bilateral and Multilateral programmes. earlier at Department of Science & Technology, in CSIR and also as an S&T Counselor and Head of the Science & Technology Wing of the Embassy of India in Moscow, Russia during June 2011 to June 2015. | rsb@csir.res .in |





Science Summit at the 78 United Nation General Assembly (SSUNGA78)

Session 4 - Affordable Healthcare for Global Society (SDG 3 – Good Health and Well-being) Chair - Dr. Ram Vishwakarma, Distinguished Scientist, CSIR; Co-Chair - Dr. Vinay K. Nandicoori, Director, CSIR-CCMB

| Overview of the Session | Dr. Ram Vishwakarma, Distinguished Scientist, CSIR | 1633 | Dr. Ram Vishwakarma would be Moderating and presenting the Overview of the Scientific Sessions. | Ram Vishwakarma is with the Council of Scientific & amp; Industrial Research (CSIR) as a Distinguished Scientist, after having served as the Director of CSIR-Indian Institute of Integrative Medicine, Jammu (2009-2020). Prior to joining CSIR, he served as a Vice-President & amp; Head of Medicinal Chemistry at Piramal Healthcare, Mumbai (2005-2009), and Staff-Scientist at National Institute of Immunology, New Delhi (1993-2005). He did his Ph.D. (medicinal chemistry) from CSIR-CDRI, Lucknow and Post-doctoral (biosynthesis of Cynocobalamin / Vitamin B 12 and Hemoglobin) from the Cambridge University. He has core expertise in drug discovery, chemical-biology, glycobiology, preclinical/clinical development with over 350 original publications, 75 patents, and several IND drug candidates to his credit; conceptualized/contributed to societal / therapeutic / industry mission projects; received multiple recognitions including the election to the Fellowship of the National Academy of Sciences of India, and Sun-Pharma (Ranbaxy) Research Award for pharmaceutical sciences. | ram.vishwak arma@csir.r es.in |
|----------------------------|---|------|---|---|-------------------------------------|
| | Dr. Vinay K. Nandicoori, Director, CSIR- CCMB | 1638 | | Dr Vinay Nandicoori is well known Molecular Biologist who has contributed immensely to delineating the signalling networks in Mycobacterium tuberculosis, the causative agent of TB. He did his M.Sc in Biotechnology at Indian Institute of Technology, Bombay and Ph.D in Molecular and Cellular Biology from IISC, Bangalore. He was a Postdoc at Texas A & M University and University of Virginia before returning to India in 2004 to establish his research group at National Institute of Immunology, New Delhi. He has 80 research papers to his name in international journals of high repute. He holds the prestigious JC Bose fellowship. He is the recipient of NASI- Scopus Young Scientist Award. He is an elected fellow of all three Science Academies in India. | director@cc mb.res.in |





chandakgrc @ccmb.res.i

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| A comprehensive model for prevention and management of Sickle Cell Anaemia | Dr Giriraj Ratan Chandak, J C Bose Fellow, CSIR-CCMB | 1638 | Sickle Cell Anaemia is highly prevalent in India and leads to severe morbidity and mortality. Although, it occurs due to a common mutation in beta-globin gene, the phenotype is highly variable including the therapeutic response to the only available drug, Hydroxyurea. The disease is easily preventable through early screening however, there have been challenges in early detection of patients and carriers. This talk will encompass how, using a multi-pronged approach under CSIR-Sickle Cell Anaemia Mission Programme, we have worked out a totalitarian model for disease screening followed by prenatal diagnosis, development of a cheap, rapid and robust screening-cum- confirmation molecular test, optimise treatment with hydroxyurea and workout protocols for gene-editing as the definitive treatment. | A physician-scientist with interest in understanding the genetic basis of monogenic disorders like sickle cell anemia with a goal to reduce their burden and understand gene-gene and gene- environment interaction in the pathogenesis of complex non- communicable disorders like diabetes, pancreatitis, metabolic syndrome. Major outcome of his research is that genetic basis of various diseases is different in Indians and is influenced by environmental factors including nutrition. His research work has been published in Acclaimed peer-reviewed journals like Lancet, Nature, Nature Genetics, Diabetes, Gut, etc He is a Fellow of all Science Academies of India and has been bestowed with various awards. |
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| Indian Breast Cancer Genome Atlas | Dr Shantanu Chowdhury, Chief Scientist, CSIR- IGIB | 1650 | The multi-centre program plans to do genomic profiling of 1000 breast cancer patient tumors to characterize potential genomic signature(s) associated with response to therapy. Data from the study comprise whole genome sequencing at relatively high depth and transcriptome sequencing. Overall the program seeks to not only create India-specific cancer genomic resources, but also aid in identifying actionable molecular signatures of clinical significance. In about one-and-half years since the program started we have built a network of more than 15 primary hospitals across India, and profiled >200 tumor/normal breast cancers along with clinical follow up. Interesting trends in molecular attributes, not noticed earlier, are emerging. These might constitute ethnicity- based signatures of significance in understanding drug tolerance. | Shantanu Chowdhury is a professor at the CSIR-Institute of Genomics and Integrative Biology in Delhi. He leads the pan- India breast cancer genomes program, the first large-scale patient tumor sequencing project in India. His research interests include understanding how telomeres influence tumor- immune cell signaling, and promote immune evasion. Fundamental work from his group on how non-duplex DNA structures impact biological mechanisms are widely used. Shantanu was awarded the Shanti Swarup Bhatnagar Award in Biological Sciences, widely considered as the topmost science award in India. He is a Fellow of Indian Academies, Senior Fellow of the DBT / Wellcome Trust India Alliance and serves on the editorial board of the Journal of Biological Chemistry published by the American Society of Biochemistry and Molecular Biology. |

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Science Summit at the 78 United Nation General Assembly (SSUNGA78)

| CSIR's R&D in Medical Instruments and Devices for the Society | Dr Sanjeev Soni, Senior Principal Scientist, CSIR- Central Scientific Instruments Organisation (CSIR-CSIO) | 1702 | This talk highlights the contribution of CSIR's research & development in the area of medical devices and instrumentation for the society. CSIR's R&D in medical devices falls in categories viz., Diagnostic & Therapeutic devices, Assistive and Rehabilitation devices, Biomaterials & Implants, and Management of medical devices for the hospitals etc. The development of various medical devices under these categories will be presented. Apart from this, the active role of CSIR in dissemination of this knowledgebase within India and specifically at global level for the management of medical devices through training on operation, maintenance, inspection and condemnation etc. will be presented. | Sanjeev Soni is working as Senior Principal Scientist in CSIR- Central Scientific Instruments Organisation Chandigarh, India in the area of biomedical instrumentation since 2005. He holds Ph.D. (Engg.) degree from Indian Institute of Technology Ropar, India. Presently, he is pursuing research in the domain of plasmonic photothermal phenomenon for biomedical applications like, plasmonic photothermal cancer therapeutics, plasmonic photothermal sterilization, plasmonic photothermal modulated drug delivery etc. His other research interests include development of visible-near infrared light sources, biological heat transfer, bio-photonics, optical properties of nanoparticles and medical robotics. | ssoni@csio. res.in |
|--|--|------|---|---|----------------------------|
| | Dr Ravi Prem, Forbes and Company Limited, Mumbai | 1714 | Medical Instrumentation | | ravi.prem@f orbes.co.in |
| Discussions & Q&A | | 1719 | | | |

Session 5 - Rural Development and Traditional Knowledge - From Hamlets to Industries (SDG 1 – No Poverty; SDG 2 – Zero Hunger; SDG 10 - Reduced Inequality and SDG 12 - Responsible Consumption and Production) Chair - Dr Ranjana Aggarwal, Director, CSIR-NIScPR; Co-Chair - Dr Sudesh Kumar Yadav, Director, CSIR-IHBT

| Over | view of the ion | Dr Ranjana Aggarwal, Director, CSIR- NIScPR | 1728 | This session will bring together a glimpse of CSIR efforts to apply its innovative science and technology for creating livelihood opportunities, developing novel solutions/products from her rich traditional knowledge, and the technology pathways to achieve successful socio-economic impact. CSIR with 37 laboratories covering a wide spectrum of science and technology, has developed a most extensive and well-defined institutional system globally for protecting and | | F Ir N S V K F S n |
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Prof. Ranjana Aggarwal is the founder Director of CSIR-National nstitute of Science Communication and Policy Research (CSIR- cpr.res.in VIScPR), New Delhi. Prior to taking over as Director, CSIR CSIR-National Institute of Science Technology and Development Studies (NISTADS) she was professor of Chemistry and Director Nomen Studies Research Centre a, t Kurukshetra University, Kurukshetra,

Professor Aggarwal obtained her Ph.D. at Kurushetra University. Subsequently, she worked in many well-known European labs notably Cambridge University, Trinity College Dublin, Ireland and

director@nis





Science Summit at the 78 United Nation General Assembly (SSUNGA78)

nurturing traditional knowledge. A range of University of Trieste, Italy. She has made significant contributions products in different sectors have been created, in designing and synthesis of azaheterocycles of therapeutic translating leads from traditional knowledge interest through green routes. Besides chemistry, she is also actively engaged in evidence based Science Technology interfacing with modern science and technology Innovation (STI) Policy Studies, Communicating Science to system. The session will cover an important area of traditional knowledge-based translation in diverse stakeholders and creating livelihood for rural sector phytopharmaceuticals. Many technologies of through intervention of CSIR technologies for sustainable CSIR on the one hand have strengthened the big development. Her research contributions have been acknowledged in the form industries and on the other hand, have created of awards notably by Indian Chemical Society and Indian Science new opportunities for SMEs. CSIR presence across different regions of the country and its Congress and Commonwealth fellowship by ACU, London. She strong focus on identifying rural challenges and has more than 100 publications to her credit in journals of high mitigating them through technology interventions repute and supervised 16 students for their Ph.D. She has been elected President of Chemical Science Section, 108th Indian has created livelihood opportunities for vast sections of the society. The session will cover Science Congress held at Nagpur. some important interventions of CSIR. The successful translation and adoption of technology needs a strategic and well-defined pathway with carefully calibrated feedback mechanisms to measure the socio-economic impact and create rural entrepreneurship. This session will highlight how CSIR technologies are creating societal impact.

> Dr Sudesh Kumar 1733 Yadav, Director, CSIR-IHBT



Dr. Sudesh Kumar Yadav is an outstanding scientist and director@ih contributed significantly in the area of biotechnology, metabolic bt.res.in engineering, bioprocessing and nanobiology for crop improvement and production of value added molecules. He has extensively worked on understanding the regulation of key metabolic pathways of crops like tea, stevia, rice and horsegram as well as developed several technologies for value added products from agricultural waste biomass. He has already published more than 200 research papers, 17 patents, 3 books, 28000 citations, 55 h-index. Listed by Stanford University among the top 2% scientists of the world. He is fellow of national academies such as The National Academy of Sciences, India; National Academy of Agricultural Sciences. He is recipient of S. Ramachandran National Bioscience Award, NASI-Reliance





| | | | | Industries Platinum Jubilee Award, and "Recognition Award' by NAAS. He has also been conferred Indian National Science Academy (INSA)-Young Scientist Award, 2008; The National Academy of Science, India (NASI)-Platinum Jubilee Young Scientist Award, 2009; Council of Scientific and Industrial Research (CSIR)-Young Scientist Award, 2010; BOYSCAST Fellowship, 2008 by DST, Gol; NAAS-Associate, 2013; Prof. Hira Lal Chakravarty Memorial Award of Indian Science Congress Association (ISCA), 2012-2013; Haryana Yuva Vigyan Ratna Award, Haryana Govt., 2011-12. | |
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| Livelihood creation and upliftment through technology-based interventions | Dr Prabodh Kumar Trivedi, Director, CSIR- Central Institute of Medicinal and Aromatic Plants (CSIR-CIMAP) | 1733 | Medicinal and aromatic plants are a major resource base for the fragrance flavor and herbal industries and provide livelihood and health security to a large population segment. To sustain the production and export potential of such crops, CSIR has launched several projects, including the CSIR-Aroma Mission. CSIR has demonstrated high-yielding superior varieties and improved agro-technologies for technology-based livelihood creation in rural areas, providing an economically beneficial alternative to the traditional crops and quality raw material to the Industries. The presentation will cover CSIR's initiatives and success in livelihood creation and upliftment of India's rural population through technology-based interventions. | Dr Prabodh Kumar Trivedi is the Director of CSIR-Central Institute of Medicinal and Aromatic Plants. He is also the theme director of AgriNutriBiotech and Mission Director, CSIR Aroma Mission. Dr Trivedi has more than thirty years of research experience in the area of Plant Genomics and Biotechnology. He has published >170 publications and contributed toward 17 book chapters. He has supervised >20 PhD. students. Dr Trivedi is JC Bose Fellow, Fellow of Indian National Academy Sciences (FNA), Fellow of Indian Academy of Sciences (FASc), Fellow of National Academy of Agriculture Sciences (FNAAS) and Fellow of National Academy of Sciences (FNASc). | director@ci map.res.in; prabodht@c imap.res.in |
| Traditional knowledge inspired contemporary research for affordable healthcare | Dr Radha Rangarajan, Director, CSIR- Central Drug Research Institute (CSIR-CDRI) | 1744 | Traditional healthcare systems are time tested compendiums of knowledge, skills and practices to achieve good health and treat disease. In India, medicinal systems such as Ayurveda, Unani and Siddha have existed for centuries. To give them a contemporary framework, a number of CSIR institutes are conducting research on the safety and efficacy of plant derived substances with origins in traditional texts. These efforts have been | Dr Radha Rangarajan has been involved in translational research and product development for the last two decades. She worked in the Drug Discovery division of Dr Reddy's Laboratories between 2003 and 2009. Thereafter, she co- founded Vitas Pharma, a drug discovery and development company focused on novel therapies for resistant infections. Prior to her current role, she was Chief Technology Officer at HealthCubed, a medical devices company developing affordable diagnostics. Dr Rangarajan obtained her B.S degree in Biology from | director@cd ri.res.in |





| | | | bolstered by the Indian Regulatory pathway for phytopharmaceuticals that came into effect in 2015. I will present examples of two drugs being developed by CSIR-CDRI through the phytopharmaceutical route to deliver clinically validated and affordable therapies. | Stanford University and Ph.D. from the Rockefeller University. She was a postdoctoral fellow at the Harvard School of Public Health. | |
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| Technology Development Assessment: Societal Impact | Dr Sujit Bhattacharya, Chief Scientist, CSIR-National Institute of Science Communication and Policy Research (CSIR- NIScPR) | 1755 | A key objective behind technology development in CSIR is to create opportunities for the rural economy aligning with the government missions/programs for rural development. The technology interventions in CSIR are supported by technology assessment, creating institutional mechanisms for handholding and participatory engagements for successful adoption by the rural community, creating rural entrepreneurship and new sources of income guided by region-specific assessment of technologies suitable therein. The talk will highlight some of these aspects bringing examples from CSIR technology including socio-economic impact assessment of the technology interventions [video clip of beneficiary will also be part of this talk]. | Prof (Dr.) Sujit Bhattacharya is Chief Scientist and Dean Policy Research at CSIR-NIScPR and Professor in AcSIR. He is Editor- in-Chief of the Journal of Scientometric Research (indexed SCI and SCOPUS). He is PhD from IIT–Delhi, and MSc (Physics) Delhi University. Was Professor of Science Policy – Jawaharlal- Nehru- University during 2007-2009. His research area covers Science-Technology-Innovation studies, Scientometrics, and IPR. Authored around 100 papers and Co-authored/Co-edited Eight books. Has presented papers at various national/international forums and has coordinated/member of various international/national level projects, and core committee member of various national/international bodies and in Editorial Board of four international journals. | sujit@niscpi |
| Climate change and rural housing (India) | Dr P. K. Das, Member, National Task Force on Rural Housing & Habitat, Ministry of Rural Development | 1805 | India's diverse geographical spread gives rise to a wide range of distinctive climate conditions throughout the country, which also undergo significant variations across seasons. A major portion of the Indian subcontinent experiences a predominantly hot climate for a significant duration of the year, while the interiors experience hot and dry climate, whereas the long coastal belt experiences hot and humid climate. In either scenario, heat (high temperature) is the issue. The poor people suffer though the climate, whereas those who can afford, spend a huge money in the form of air conditioning. In India 65% population lives | Dr Prabir Kumar Das is a design and construction specialist with specific technical experience in Project Appraisal, Planning, implementation and Maintenance Management of community based construction (specially, education and healthcare infrastructure). Das's passion is gender-sensitive space and barrier free school design. His concept of educational space is always viewed from children's perspective. As a freelance consulting architect Dr Das has worked for DFID, UNDP, UNHABITAT, ARCADIS BMB, INGOs, Government of India, etc. Dr Das also has fifteen years of teaching experience at University level. | pkpeudas@ gmail.com |





Science Summit at the 78 United Nation General Assembly (SSUNGA78)

| | | in Rural area, and hence it is important to provide affordable, safe and thermally comfortable climate resilient shelter using sustainable technologies and ensuring the preserves of livelihood. The presentation will provide an insight on the initiatives taken by the Rural Housing & Habitat, Ministry of Rural Development, Gol, New Delhi on Climate Resilient Rural Housing in association with the CSIR-CBRI, Roorkee. | Dr Das is an Active Member of the NATIONAL TASK FORCE on RURAL HOUSING AND HABITAT, Government of INDIA, Ministry of Rural Development. | |
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| Discussions & Q&A | 1816 | | | |

Session 6 - Summary and Panel Discussion; Theme - Innovations for Global Sustainable Development (SDG 5 – Gender Equality and SDG 17 – Partnerships for the Goals)

Moderator - Dr Abhay A Pashilkar, Director, CSIR-NAL

| | Overview of the Session | Moderator – Dr Abhay A Pashilkar, <i>Director, CSIR-</i> <i>NAL</i> | 1823 | Dr. A Pashilkar, would be moderating the session discussing about R&D activities and efforts of CSIR for human resource development, partnership with UNIDO, role of CSIR in Summit of Future 2024. Dr Pashilkar would be making concluding remarks towards the end of session. | |
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| | | | simulation, parameter estimation, flight control and human factors in aviation. | |
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| Concluding Session | Panel 1. Dr Ram Vishwakarma, Distinguished Scientist, CSIR | 1828 | Panel Experts Ram Vishwakarma is with the Council of Scientific & amp; Industrial Research (CSIR) as a Distinguished Scientist, after having served as the Director of CSIR-Indian Institute of Integrative Medicine, Jammu (2009-2020). Prior to joining CSIR, he served as a Vice-President & amp; Head of Medicinal Chemistry at Piramal Healthcare, Mumbai (2005-2009), and Staff-Scientist at National Institute of Immunology, New Delhi (1993-2005). He did his Ph.D. (medicinal chemistry) from CSIR-CDRI, Lucknow and Post-doctoral (biosynthesis of Cynocobalamin / Vitamin B 12 and Hemoglobin) from the Cambridge University. He has core expertise in drug discovery, chemical-biology, glycobiology, preclinical/clinical development with over 350 original publications, 75 patents, and several IND drug candidates to his credit; conceptualized/contributed to societal / therapeutic / industry mission projects; received multiple recognitions including the election to the Fellowship of the National Academy of Sciences of India, and Sun-Pharma (Ranbaxy) Research Award for pharmaceutical sciences. | <u>ram.vishwak</u> arma@csir.r <u>es.in</u> |
| | 2. Dr Ranjana Aggarwal, Director, CSIR-NIScPR | | Prof. Ranjana Aggarwal is the founder Director of CSIR-National Institute of Science Communication and Policy Research (CSIR- NIScPR), New Delhi. Prior to taking over as Director, CSIR CSIR- National Institute of Science Technology and Development Studies (NISTADS) she was professor of Chemistry and Director Women Studies Research Centre a,.t Kurukshetra University, Kurukshetra, Professor Aggarwal obtained her Ph.D. at Kurushetra University. Subsequently, she worked in many well-known European labs notably Cambridge University, Trinity College Dublin, Ireland and University of Trieste, Italy. She has made significant contributions in designing and synthesis of azaheterocycles of therapeutic interest through green routes. Besides chemistry, she is also | <u>director@nis</u> <u>cpr.res.in</u> |



Science Summit at the 78 United Nation General Assembly (SSUNGA78)



3. Dr Ashish Lele, Director, CSIR-NCL

actively engaged in evidence based Science Technology Innovation (STI) Policy Studies, Communicating Science to diverse stakeholders and creating livelihood for rural sector through intervention of CSIR technologies for sustainable development.

Her research contributions have been acknowledged in the form of awards notably by Indian Chemical Society and Indian Science Congress and Commonwealth fellowship by ACU, London. She has more than 100 publications to her credit in journals of high repute and supervised 16 students for their Ph.D. She has been elected President of Chemical Science Section, 108th Indian Science Congress held at Nagpur.



Dr. Ashish Lele, took over the charge as the Director of CSIR-National Chemical Laboratory, Pune on April 2022. Initially Dr. Lele was Senior VP & amp; Head, Advanced Materials and Alternative Energy Group at Reliance Industries Ltd. Dr. Lele completed his Chemical Engineering graduation from the Department of Chemical Technology (ICT), University of Bombay, in 1988. He obtained Ph.D. in Chemical Engineering from the University of Delaware, USA in 1993. He joined CSIR-NCL in 1993 as a scientist and set up a research group on the rheology of complex fluids, polymer dynamics, and polymer processing. He led many industry-sponsored research projects at the laboratory and carried out several product development activities. He led the efforts for developing PEM fuel cell technology in a consortium of three other CSIR laboratories and three Indian industries.

Dr. Lele has authored 75 research papers in international peerreviewed journals and 6 patents. He has supervised 17 Ph.D. theses. Dr. Lele has been the recipient of the Shanti Swaroop Bhatnagar Award in Engineering Sciences in 2006, Infosys prize in Engineering and Computer Science in 2012 and, the ICT Distinguished Alumnus award in 2013. Other recognitions include CSIR Young Scientist Award (1994), INSA Young Scientist Award (1996), ICT Young Scientist Award (2003). He is a fellow Indian National Science Academy, Indian Academy of Sciences, <u>director@ncl</u> .res.in



Science Summit at the 78 United Nation General Assembly (SSUNGA78)





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Dr. Atul Vaidya did B. Tech. in Chemical Engineering from Laxminarayan Institute of Technology (LIT), Nagpur and M. Tech. in Chemical Engineering from IIT-Bombay. He obtained Ph.D. in Chemical Engineering from RTM Nagpur University. At present, Dr. Vaidya is Director of the CSIR-National Environmental Engineering Research Institute (CSIR-NEERI). Earlier, he was Chief Scientist and Head of Chemical and Hazardous Waste Management Division, CSIR-NEERI. He has over 34 years of research experience in environmental science and engineering, especially in waste management. Dr. Vaidya has extensively worked on various aspects of waste management, including characterization, treatment, reuse and recycle, impacts on the environment, Green House Gas (GHG) emissions and environmentally sound practices, such as waste

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Science Summit at the 78 United Nation General Assembly (SSUNGA78)



6. Prof Pradeep Κ Ramancharla. Director. CSIR-CBRI 7. Prof Anil K Gupta, The World

minimization, clean technology, circular economy. He is also actively working for Stockholm convention, UNFCCC and Minimata convention. He also has experience in biotechnology and technology demonstration. He has implemented effective technological options for environmentally sound management of hazardous wastes at various industries in the country. Dr. Vaidya has facilitated decision-making across the country through his basic and translational interdisciplinary research on various environmental issues. His contributions in national and international environmental policies have been noteworthy. He has published many research papers in national and international journals.

Prof Ramancharla Pradeep Kumar, Director, CSIR-CBRI. Did director@cb BTech in 1995 from Vasavi College of Engineering, MTech in ri.res.in 1997 from IIT Kanpur and PhD in 2001 from The University of Tokyo. He is a structural engineer with 20+ years of experience in teaching and research. His areas of specialisation are nonlinear behaviour of structures and earthquake safety assessment of buildings. Guided the doctoral thesis of 13 students and published 120 Journal papers. His notable contributions are 1) Establishing Earthquake Engineering Research Centre (EERC), 2) Stated an MTech program in Computer Aided Structural Engineering (CASE), 3) National report on Earthquake Disaster Risk Indexing of Cities/Towns, 4) A Primer on Rapid Visual Survey (RVS), 5) Passionate contribution towards Universal Human Values in Academic Institutions. He is currently a BIS panel member of IS 456 & IS 1343, Earthquake Engineering Sectional Committee, National Building Code and IRC bridge standards & specification committee.

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