



MINISTRY OF SCIENCE AND TECHNOLOGY
MINISTRY OF EARTH SCIENCES
MINISTRY OF HEALTH & FAMILY WELFARE
GOVERNMENT OF INDIA

सत्यमेव जयते



VIJNANA BHARTI



INDIA INTERNATIONAL SCIENCE FESTIVAL 2020

“आत्मनिर्भरभारताय विश्वकल्याणाय च विज्ञानम्”



आत्मनिर्भर भारत

Science for Self-Reliant India and Global Welfare



22-25 December 2020





DR M RAJEEVAN

Secretary, Ministry of Earth Sciences

The twenty first century has so far seen an exponential growth in terms of science and technology all around the world. A nation's development and prosperity are judged to a large extent by its status of science and technology.

The India International Science Festival aims to strengthen and integrate the existing scientific knowledge and their societal applications. It also aims to promote to build scientific temper and impart the "spirit of enquiry" among the young children and the masses.

I wish all the stake holders of science and technology and allied organizations who are part of this festival a grand success.



DR RENU SWARUP

Secretary, Department of Biotechnology

I am glad to know that the 6th India International Science Festival (IISF)-2020 is being organized by Ministry of Science & Technology, Ministry of Earth Sciences and Ministry of Health & Family Welfare in association with Vijnana Bharati (VIBHA) during 22-25 December 2020 at New Delhi in virtual mode. IISF 2020 is a vibrant expression of the power of Science and Technology to bring out solutions of impact for the nation and the world. IISF offers many various forms of engagement between scientists & researchers and students & citizens through lectures, dialogues, panel discussions and debates, demonstrations, shows, exhibitions, and workshops. The conference proposes to bring more than 10000 researchers including experts from different subjects to discuss their research findings and exchange innovative ideas on the identified research themes. A unique platform of India International Science Festival intends to inspire curiosity and make learning more rewarding and to help youth to discuss and understand the potential of cutting edge Science & Technology with a focus on scientific knowledge, creativity, critical thinking, problem-solving and teamwork.



PROF BALRAM BHARGAVA

Secretary, DHR & DG, ICMR

India International Science Festival (IISF) brings together greatest minds in the area of Science & Technology and provides a unique platform for fruitful interactions and discussions with all the stakeholders. This also provides an unique opportunity in connecting 'Science with the Society'. It truly personifies the idea of "leaving no one behind". Indian Council of Medical Research (ICMR) is committed towards promotion and dissemination of health research for the masses. Our past experiences of participation in IISF have been rewarding and we are excited to participate in such a magnificent programme this year as well.



डॉ हर्ष वर्धन Dr Harsh Vardhan

स्वास्थ्य एवं परिवार कल्याण, विज्ञान और प्रौद्योगिकी
व पृथ्वी विज्ञान मंत्री, भारत सरकार

Union Minister for Health & Family Welfare,
Science & Technology and Earth Sciences
Government of India

सबका साथ, सबका विकास, सबका विश्वास
Sabka Saath, Sabka Vikas, Sabka Vishwas



MESSAGE

India has been the land of great Rishis and Munis who have fathomed deep scientific concepts in their spiritual pursuit to attain moksha. This scientific temper is evident in our ancient texts such as Vedas and Upanishads. Various ancient schools of science, medicine and mathematics are part of our rich heritage. Existence of premier international institutions such as Nalanda, Taxila and Vikramshila are symbolic of the pride we took in teaching the world about our ideas of Sciences. Many great scientific discoveries / advancements and technological achievements in the field of Mathematics, Astronomy, Architecture, Chemistry, Metallurgy and Medicine & Surgery have showcased excellence of our civilisation in Science & Technology to the world. Recently, in the COVID-19 pandemic, India has once again established itself as a pioneer in tackling the situation as well as in all fronts of scientific development, from testing kits to vaccine research.

India International Science Festival (IISF) is a celebration of Science and Technology by engaging with public from different cross-sections of our society and showcasing how Science, Technology, Engineering and Mathematics (STEM) are providing us with the solutions to improve our lives. It also educates our present generation as to how, over the centuries, India has been an inspiration for different countries in bringing new thoughts, ideas and novel innovations. IISF, launched in 2015, has, over the years, created a unique platform for inspiring curiosity and making learning more rewarding.

It is heartening to know that the 6th India International Science Festival (IISF) is being organized by Ministry of Science & Technology, Ministry of Earth Sciences and Ministry of Health & Family Welfare in association with Vijnana Bharati (VIBHA) during 22-25 December 2020 at New Delhi in virtual mode. I am sure that with use of digital platform, IISF will be able to bring together science loving people from the remotest

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corners of the country in a single click, thereby helping in fulfilling the objective of organising IISF.

I am happy to note that the number of events of IISF 2020 have increased from 28 to 41 covering many more important facets of Science, Technology and Innovation (STI) in tackling newer challenges that the world is grappling with today. The events are thoughtfully designed to ensure that not only are the STI advancements brought at the forefront but also to link them to History, Philosophy, Arts and Education. I hope that even the pre-existing events will grow richer in content and the new events will make the festival more holistic.

The proposed theme for IISF 2020: ***“Science for Self-Reliant India and Global Welfare”*** is very relevant in the present context when nation is looking towards Science & Technology for accelerating growth and for spearheading the vision of our Hon’ble Prime Minister of India Shri Narendra Modi ji of an “Atmanirbhar Bharat” playing “a bigger and more important role in the global economy”.

I wish IISF 2020 a mega success in achieving its objectives and look forward to huge participation from all sections of the society.


(Dr. Harsh Vardhan)



डॉ. शेखर चिं. मांडे

एफएनए, एफएएमसी, एफएनएएमसी

सचिव

वैज्ञानिक और औद्योगिक अनुसंधान विभाग तथा
महानिदेशक

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Department of Scientific & Industrial Research and
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विज्ञान और प्रौद्योगिकी मंत्रालय

वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद्

वैज्ञानिक और औद्योगिक अनुसंधान विभाग

Government of India

Ministry of Science and Technology

Council of Scientific & Industrial Research

Department of Scientific & Industrial Research




Message

It gives me immense pleasure to announce that the 6th **India International Science Festival (IISF) 2020** is being jointly organized by Ministry of Science & Technology, Ministry of Earth Sciences and Ministry of Health & Family welfare in association with Vijnana Bharati (VIBHA) during 22-25 December 2020 at New Delhi in virtual mode. This year the Council of Scientific & Industrial Research (CSIR) is the coordinating organization for the festival.

The India International Science Festival (IISF) is a much-awaited annual event for students and science loving citizens from all spheres of life who look forward to gain new knowledge in the form of scientific developments and also creates opportunities for scientists, innovators and young researchers to interact, share their ideas and collaborate. It celebrates Science & Technology by showcasing how Science, Technology and Innovation had been instrumental in improving the quality of our lives which had from time to time directly or indirectly led to the progress of the nation.

This year, inspite of the pandemic situation of COVID-19, the IISF-2020 is being organized on a virtual platform which signifies the indomitable spirit of nurturing and celebrating scientific temperament amongst all stakeholders of Science, Technology and Innovation. I hope that the festival will ignite creativity in minds and instill the spirit of pursuing science for societal developments. The theme for this year IISF-2020 “**Science for Self-Reliant India and Global Welfare**” is expected to intensely deliberate on the role of Science, Technology and Innovation to build an Atmanirbhar Bharat and at the same time provide solutions to global problems.

I extend a very warm welcome to all the delegates from India and abroad to IISF-2020, which is being organized on a virtual platform for the first time.


[Shekhar C. Mande]

New Delhi
November 5, 2020

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MESSAGE

The 6th India International Science Festival (IISF)-2020 which is being organized amidst the pandemic situation of COVID-19 signifies the ethos of the scientific community in India in bringing all the scientific endeavor of the nation closer to the society and inculcating scientific temperament among the different stakeholders starting from school students to university students, researchers, teachers, industries and others is high on the agenda.

This year the theme of IISF is "Science for Self-Reliant India and the Global Welfare". This theme is extremely relevant in the context of the pandemic challenge of Covid 2019 the whole world is facing today and India's rapid response to this challenge through a spectrum of innovation that have been brought forth by our chain of labs across the country leveraging India's great heritage of AYUSH healthcare systems. This year CSIR has taken the challenge to host IISF 2020 and translate it into opportunities to take the IISF 2020 to a much larger audience by hosting it on *Virtual Platform*. CSIR-NISTADS, the nodal institute for IISF 2020 is taking forward the aura of the festival of science, IISF 2020 to remotest parts of the country and the international scientific community as well.

I am happy to note that in addition to 28 events organized last year, 12 new events on very relevant topics like History of Science, Water, Energy, Waste and Sanitation, Clean Air, Biodiversity have also been added this year which will make the festival more holistic. I am sure that enriching deliberations in IISF 2020 will lead to attaining self-reliance that the nation is aspiring for and is therefore a step towards building Atmanirbhar Bharat. As the previous IISFs had made a footprint internationally and had broken several Guinness Book World Records, this year also I look forward to several such occasions which make us proud and showcase our scientific and technological progress world-wide

I wish IISF 2020 a grand success and on behalf of Vijnana Bharati congratulate everyone who is a part of this celebration.

Dr. Vijay P. Bhatkar

A handwritten signature in blue ink that reads "Vijay Bhatkar".

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MESSAGE

A modern nation's developmental success, security and prosperity it achieves and maintains are largely dependent upon its scientific capability and prowess. To guide the nation towards scientific pursuits, certain catalysts are found to be useful. The India International Science Festival is a one of its kind mechanism that has been drawing attention of the common man towards science and technology.

In the year 2015, the India International Science Festival was envisaged to generate curiosity of science and scientific temper among the general public and more importantly to ignite the minds of students and youth by means of expos, exhibitions, publication of popular scientific literature, science films, etc. It is satisfying to note the continuous growth in scale and popularity of the Festival over the last five years indicating fulfillment of its aim and objectives.

I am glad to recall that I have been associated with India International Science Festival from its very inception in 2015 at IIT Delhi.

IISF is not only meant to persuade the general public, students and youth but also to provide a platform for bringing together scientific-minded people from different walks of life thereby paving the way for fruitful exchange of ideas through conferences, meets and conclaves.

It gives me immense pleasure that despite the Covid-19 pandemic, the 6th edition of IISF (IISF-2020) is being organised this year too, albeit virtually, to keep the spirit of the festival alive. This time around, the Festival is more significant as it will celebrate the efforts of mankind and science to overcome unprecedented adversities.

My best wishes to all those who are associated with the 6th edition of India International Science Festival in making it a grand success. I also take this opportunity to urge all of them to follow every possible preventive measure to contain the spread of the pandemic and remain safe while celebrating the Festival in all its grandeur.

(Ashutosh Sharma)

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VISION

Promotion of 'Atmanirbhar Bharat' and Global Welfare through Science, Technology & Innovation

MISSION

The year 2020 witnessed the world passing through a critical phase because of the outbreak of an infectious novel coronavirus. Scientists the world over have been struggling to find a cure for this pandemic. With no precise solution in hand the only way out is to adopt preventive measures like restricting human activities in a scientific manner to limit the spread of the dreadful virus. The restrictions, in turn, have seriously affected travel, transportation, trade, industries and hampered routine life.

Needless to say, the situation has forced everyone across the world to find solutions that are essentially local. Our Prime Minister, acknowledging the circumstances, has rightfully given a clarion call for 'Atmanirbhar Bharat' – a self-reliant India. Having recognized the vital role of science, technology and innovation in achieving self-reliance during this period of crisis the Indian S&T fraternity and all R&D institutions have responded swiftly and successfully to the call. This has helped immensely in building the desired confidence amongst people. There is a need to convey and showcase the achievements and actions taken to gain self-reliance through S&T to the society. India International Science Festival of 2020 – IISF 2020 – brings in an opportunity to demonstrate the strength and potential of Indian S&T not only to the people of India but to the entire international community as well.

During these turbulent times, despite encountering various international challenges, especially because of the aggressive attitude of neighbors in the region, we have courageously displayed our indomitable resolve to protect our national interests. This reminds us of the techno-centric exercise carried out by Dr. APJ Abdul Kalam in coming up with a 'Technology Vision 2020' to achieve the status of a developed nation. In this visionary document he expressed and emphasized the need to achieve self-reliance in strategic sectors in the context of national security. There is a greater need to build indigenous S&T capability to protect the sovereignty of the country.



**An equation
means nothing
to me unless
it expresses a
thought of God.**

Srinivasa Ramanujan
1887–1920



**Unless India
stands up to the
world, no one will
respect us. In this
world, fear has
no place. Only
strength respects
strength.**

Dr APJ Abdul Kalam
1931–2015

A unified and generous worldview, based on the philosophy of ‘Vasudhaiva Kutumbakam’, exhorts us to utilize Indian S&T advancements for both – ‘Atmanirbhar Bharat’ and ‘Global welfare’. It is time to make the world see the role of Indian Scientists in addressing global challenges.

“Science for Self-Reliant India and Global Welfare” has therefore been chosen as the focal theme of the Sixth India International Science Festival (IISF) to be held during 22-25 December 2020. The Sixth IISF will be unusual in the sense that in keeping with the demands of the times it will be organized in a virtual environment.

Launched in 2015, the India International Science Festival (IISF) has become a much-awaited annual event that celebrates Science & Technology and demonstrates how science could lead the country’s progress. The unique platform of the India International Science Festival was created by the Ministry of Science & Technology, the Ministry of Earth Sciences and the Ministry of Health and Family Welfare in association with Vijnana Bharati (VIBHA).

India International Science Festival is a unique combination of seminars, workshops, exhibitions, lectures, panel discussions and debates with interactive forms of engagement including hands-on demonstrations, film and magic shows, interactive dialogues with experts, and science-related theatre, music and poetry. The science festivals provide a vibrant environment for students and citizens from all walks of life to witness science in action and are designed to instill creativity, critical thinking, problem-solving ability, and teamwork among the country’s youth to take the country forward.

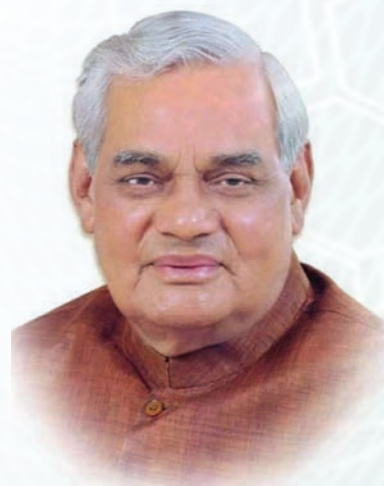
This year, the India International Science Festival begins on 22 December 2020, the birthday of Srinivas Ramanujan, and culminates on 25 December 2020, the birthday of former Prime Minister of India Shri Atal Bihari Vajpayee. Ramanujan was a world-renowned Indian mathematician and an inspiring figure among the pantheon of Indian scientists. Shri Atal Bihari Vajpayee was a much-loved political figure who added to the inspiring slogan of ‘Jai Jawan, Jai Kisan, ‘Jai Vigyan’ – reflecting his deep commitment to the belief that S&T would always be at the core of the nation’s progress.

We hope the Sixth India International Science Festival will provide the spark of innovativeness and a strong belief in science and scientists among the country’s citizens that will catapult the country into becoming a world leader.



**Arise, awake
and do not stop
until the goal is
reached.**

*Swami Vivekanand
1863-1902*



**Jai Jawan
Jai Kisan
Jai Vigyan**

*Atal Bihari Vajpayee
1924-2018*

BACKGROUND & GLIMPSES

The Indian International Science Festival (IISF) has created a platform to create an innovative knowledge society to inspire curiosity and make learning more rewarding for the young, while motivating the public to engage with and celebrate the joy of science. The IISF 2020 is the sixth of the series, organized continuously since 2015-2019. Every year IISF has witnessed diversity in its programmes in terms of number of events, participants, etc. and inclusion of programmes like Students' Science Village, Women Scientists & Entrepreneurs Conclave, Green Good Deeds, Face-to-Face with New Frontiers in Science has made this event a mega success.

The first edition of IISF was held during 4-8 December 2015 at the Indian Institute of Technology, New Delhi. Ministry of Science and Technology, Ministry of Earth Sciences and Vijnana Bharati collectively organized it with Department of Science and Technology as the nodal organizer and TIFAC as the coordinating department.

IISF 2015 gave deep insight into the involvement of Science & Technology in India. It provided a platform to witness innovative practices and achievements by the Indian science & technology system. It also provided an effective platform for scientists-students interactions as well. A Guinness Book of World Record was created.

The second edition of IISF was held at CSIR-NPL, New Delhi during 7-11 December 2016 under the theme **"Science for the Masses"**. Ministry of Science and Technology, Ministry of Earth Sciences and Vijnana Bharati jointly organized the event along with CSIR as the nodal organisation and National Physical Laboratory (NPL) acted as coordinating department.

A unique event "Student's Science Village" was introduced; there were more than 1900 village students and teachers take part across the country. All the participants were nominated by Hon'ble Members of Parliament from their respective adopted villages under the Pradhan Mantri Sansad Aadarsh Gram Yojana. Around 5500 scientists, researchers, technocrats, communicators and registered delegates participated in 7 different events.

The third edition of IISF was held during 13-16 October 2017 at the Indian Institute of Technology, Madras and Anna University, Chennai under the theme **"Science for New India"**. The event was a collective effort of Ministry of Science and Technology, Ministry of Earth Sciences and Vijnana Bharati. Coordinated by MoES and National Institute of Ocean Technology





(NIOT) acted as coordinating Institute. Nearly 5 lakh visitors witnessed the festival & more than 7000 registered delegates participated in 16 different events and a Guinness Book of World Record was created.

The fourth edition of IISF was held from 5-8 October 2018 at Indira Gandhi Pratishthan, Lucknow under the theme **“Science for Transformation”**. It was organized by Ministry of Science and Technology, Ministry of Earth Sciences in association with Vijnana Bharati. It was coordinated by Department of Biotechnology (DBT), and the nodal agency was National Institute of Immunology (NII).

It aimed to provide a platform to young students, scientists and technocrats from across India for exchange of knowledge and ideas and also supported flagship programs like “Swachh Bharat Abhiyan”, Swasth Bharat Abhiyan”, “Make in India”, “Digital India”, “Smart Villages”, “Namami Gange”, “Unnat Bharat Abhiyan”, etc. initiated by the Hon’ble Prime Minister of India. IISF 2018 witnessed more than 10 lakh visitors and above 20 thousand registered delegates in 22 different events and also two Guinness Book of World Records were achieved. As part of the promotional activities for IISF 2018, a yatra was flagged off from three different cities.

The fifth edition of IISF was held at Biswa Bangla Convention Centre & Science City, Kolkata during 5-8 November, 2019 under the theme **“Research Innovation Science Empowering Nation”**. Ministry of Science and Technology, Ministry of Earth Sciences, Ministry of Health and Family Welfare and Vijnana Bharati collectively organized it with Department of Science and Technology (DST) as the nodal organizer and Vigyan Prasara as the coordinating institute.

IISF 2019 was inaugurated by Hon’ble Prime Minister of India. IISF 2019 witnessed more than 15 lakh footfall during the event, over 15 thousand registered delegates in 28 different events and three Guinness Book of World Record were also achieved. As part of the promotional activities for IISF 2019, a yatra was flagged off from three different cities.

IISF 2020

PROGRAMMES AT A GLANCE

Agricultural Scientists Meet

Agricultural Scientists Meet will provide a common platform for agricultural scientists, innovative farmers, teachers and students to actively participate and discuss on various emergent topics such as Synergism and tradeoffs in sustainable agriculture, NRM— challenges and policy framework, Precision farming technologies & agricultural production systems, Data-driven technologies in agriculture and their management, and Innovation and agriculture. The event has been aimed to cater the need to reduce the impact of weather vagaries on agriculture and make agriculture a reliable income earning pursuit for marginal stakeholders.

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Agritech

The Agritech event will focus on agro-technologies like high-value crops (e.g. medicinal and aromatic crops, floriculture, stevia, heeng, saffron, etc.), vertical gardening, micro-propagation for industrially important crop plants, bio-fertilizers, and improved bee hive for quality and hygienic extraction of honey for enhancing net returns of farmers and generating employment. During this event, farmers will be linked to research institutes working on agro-technologies, so that they can get details about the package of practices for these agriculture-related technologies.

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Assistive Technologies Conclave & Expo for Divyangjan

With the theme “Empowering Divyangjan through Science Technology and Innovations for Self Reliance”, the Conclave on Assistive Technologies for Divyangjan is being organized to bring together stakeholders in the Assistive Technologies (AT) value chain such as researchers, scientists, engineers, clinicians, innovators, policymakers, entrepreneurs and start-ups, government and non-governmental organizations, industries, counselors, along with Divyangjan and their care givers. This event will provide a common platform for dialogue among stakeholders addressing the challenges involved in building an effective AT ecosystem in India. The event is aimed not only to discuss current solutions but also to discuss existing problems and seed ideas for research and development for proactive R&D for building resilience among the Divyangjan as well as building a self-reliant R&D ecosystem for empowering the Divyanjan within India and at the global level.

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Biodiversity Conclave

Bio-diversity Conclave will showcase the rich biodiversity of India at ecosystem, species and genetic levels, the long tradition of bio-diversity conservation by traditional communities, and the country's efforts towards mapping the distribution of biodiversity and conservation of critical ecosystems and threatened species. The cutting-edge research being undertaken in diverse fields of biodiversity, particularly on bio-prospection for novel genes and molecules and their utilization for building a self-sustainable bio-economy for a self-reliant India, will be discussed and demonstrated during the Conclave. Impact of climate change on biodiversity, with special focus on its distribution, productivity and flow of ecosystem services will be one of the focus areas. The two-day event will include invited talks from globally recognized scientists, poster sessions, panel discussion, quiz competition and short films. The event aims to bring together academicians/scientists/researchers/students/entrepreneurs to present their research findings and exchange innovative ideas on developing bio-diversity based bio-economy for self-reliance and global welfare.

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Clean Air

The objective of the Clean Air event is to evolve effective an ambient air quality monitoring network across the country besides ensuring comprehensive management plans for prevention, control and abatement of air pollution. The Clean Air event will aim at making the citizens of India aware about the emerging air pollution issues across the country and the plausible implications on human health, food, economy and climate. The campaign will provide a suitable platform for interactions amongst non-government organisations (NGOs), civil society citizens and academic and R&D institutions to discuss the opportunities & challenges, technical interventions and strategies that can be useful in the understanding, decision-making and addressing the clean air problem. The activity is planned for the whole day, comprising popular lectures by eminent air pollution experts and panel discussion, showcasing of air pollution measuring/mitigation technologies, call for short films/essays on "Clean Air" (competitive program; online submission), etc.

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Cultural Programs

Cultural Festivals and events are increasingly becoming an arena of discourse, enabling people to view movement and dance within a cultural framework. This year a variety of cultural activities e.g. Plays, Musical Yoga, Nukkad Natak, Dance & Recital performances will be showcased to commemorate the essence of Vedic and Modern Science, with the theme "Ancient to Modern" (A Reflexive Monism).

Energy Conclave

Self-reliance and Energy are two faces of the same coin for sustainable growth and development of any country. In meeting the energy demands, the world is facing two major challenges: 'Energy Security' and 'Environmental Concern', and it has been widely accepted that the solution for both is "Renewable Energy". The Energy Conclave 2020 will therefore focus on "Renewable Energy for Self Reliance and Global Welfare" showcasing scientific & technological developments, and also deliberating on the various forms of innovations that the country will need in the coming days to establish its footprint in the greener economy.

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Face-to-Face with New Frontiers of Science

The objective of this theme is to highlight the potential of new frontiers of science for the societal development and to bring social change with its upcoming new technologies. New frontiers of science are interdisciplinary having utility across fields, such as agriculture, medicine, pharmacy, environment, energy, power, space, biosciences, machine learning, superconductivity, digital phenotyping, nanotechnology, etc. The event will focus on the development of cost-effective and efficient indigenous technologies for tackling the nation's and transnational/global problems. It will also deliberate on solutions to manage natural disasters, climate change, fast track transport systems, clean environment, emergency situations such as the current Covid-19 pandemic, etc.

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Games and Toys

The event aims to revive the long tradition of toys and games that traces back to the Harappan Civilization. Many of the modern toys and games are modified versions of these traditions. Materials used for toys and games used to be eco-friendly. Knowingly or unknowingly all these toys and games have a science/mathematics connect. This event will seek to motivate development of the mind, concentration and logical thinking and also provide a platform to display products (toys and games) by local manufacturers.

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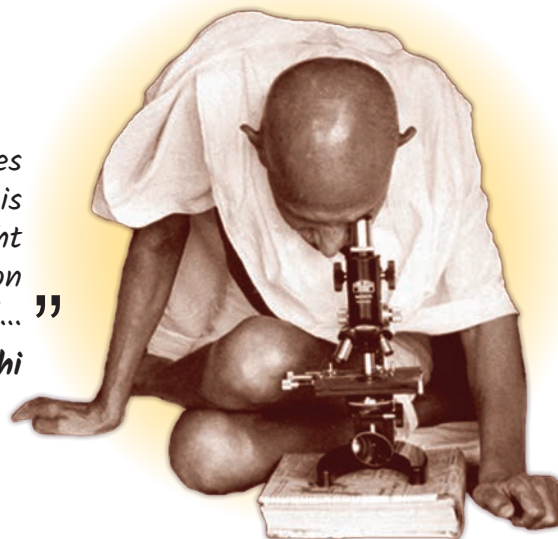
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“I claim for them nothing more than does a scientist who, though he conducts his experiments with utmost accuracy, forethought and minuteness, never claims any finality on conclusions, but keeps an open mind...”

-Mahatma Gandhi



Global Indian Scientists & Technocrats Meet

An eminent group of Indian Scientists & Technocrats diaspora would be invited for brainstorming sessions on “Disruptive technologies and opportunities of artificial intelligence and its applications.” This will provide an opportunity to connect them with Indian science and scientists and thus contribute to India’s growth through philanthropy and exchange of knowledge. GIST Meet 2020 would also organize interactions around the themes seeking the empowerment of rural masses through application of enabling technologies. This endeavor shall contribute towards AtmaNirbhar Bhaarat Mission.

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Guinness Book of World Record

World record attempts have been an integral part of IISF since its inception to encourage science popularization through active public participation. This year too, the virtual edition of IISF-2020 includes GWR to attain newer feats albeit on a virtual platform. This includes a plethora of exciting activities for building awareness and creating new records which will appeal to students and science enthusiasts of diverse age groups. Through these activities GWR 2020 aims to have a real impact on society, enabling everyone to make a strong contribution to maximize awareness of “Science for Self-Reliant India and Global Welfare”.

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Habitat (Urban & Rural)

The emerging challenges of climate change as well as the Covid-19 pandemic amply highlight the challenges in terms of a healthy and sustainable habitat. While on the one hand, Covid-19 had the maximum impact on dense urban areas, the ever-increasing needs in terms of resources like materials, energy and services and the consequent burden is also emanating from the fast pace of urbanization. The three components of the program are: (i) Competitions on Ideas for the Future of Urbanism in India, a design competition, Learning from the past-- Presentation of case studies, Techno Urbanism--A competition to develop technology-driven solutions for urban challenges, and Urban Villages-- Socio economic and technological challenges; (ii) Panel Discussions; and (iii) Short films on Urban Challenges and possibilities.

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Health Research Conclave

Health Research Conclave is an important part of India International Science Festival (IISF). It showcases the milestone achievements along with current activities and future prospects in the area of health research. The aim is to provide a platform for interaction between the policy makers, students, early researchers and the eminent experts in the field. This years' conclave will stress upon the four major theme areas: emerging & re-emerging infections, nutrition, universal health coverage & the eliminable diseases. The concept of *Atmanirbhar Bharat*, inclusion of new age technologies like AI and machine learning would be emphasized in each of these areas. The Theme of the Health Research Conclave will be "**Health Research for a Happy, Healthy and Self reliant India**".

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History of Indian Science

Congress on the History of Science in India '*From Shunya to Mangalyaan*' targets audiences from all walks of life, including students. It is an attempt to bring in greater awareness and appreciation of Indian history and achievements in Science & Technology, which not only travels back in time but also finds relevance even in today's context. Aligned to the main theme of "Science for Self-Reliant India and Global welfare", the Congress will highlight exemplary strides made by our forefathers in diverse S&T domains such as agriculture, medicine, archaeology, metallurgy, aeronautics, ship building, physical sciences and many more. The Congress will also touch upon how traditional knowledge is being viewed through the eyes of modern science and technology towards rapid integration for betterment of society and the world at large.

The event will consist of talks by eminent historians and scientists on diverse topics, live demonstrations, virtual visits, prototype competition, etc. The Congress will be a robust platform to engage children and adults alike, on the foundations of the rich Indian S&T traditions and culture which form the basis of the pillars of Modern Science.

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Industry Academia Conclave

Efficient interaction between Industries, Academia and R&D Labs, which is the backbone of technological growth in most advanced countries, is lacking in India. IISF has been addressing this dismal issue since the past few years through the 'Industry Academy Conclave'. Leaders from industry, academies, national R&D labs & incubation centres will be brought together to deliberate on the following issues through Panel Discussions:

- (i) Ways to promote industry participation in teaching as well as in research & development;
- (ii) Striving to make our academic curriculum 'industry ready';
- (iii) Expectations of MSME and industries from national research laboratories and universities, and
- (iv) Synchronizing and preserving the IPRs of all stakeholders involved in above knowledge transfers.

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International Science Film Festival of India

The International Science Film Festival of India (ISFFI) seeks to promote science popularisation among citizens and aims at attracting talented young science film-makers and science enthusiasts. The ISFFI offers an opportunity for students and film makers to get involved with the process of science communication through films. During the festival internationally acclaimed and award-winning foreign and Indian films on science, health and environment will be screened via online platforms. A competition for Indian and International professional and student film-makers will also be organised, where short films/documentary films/animation films of less than 35 minutes of length and created any time after 1 November, 2019 will be invited on the following themes:

- (i) Science for self-reliant India and/or Science for global welfare
- (ii) Science and awareness on Covid-19 and other health emergencies

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International Science Literature Festival – “VIGYANIKA”

Communication of scientific information and inculcation of scientific awareness among the citizens has never been more essential. From traditional to modern media, science communication today utilises a wide range of media channels and tools. There has also been a rich tradition of science literature in the country reflecting social attitudes towards science and scientists. Centred round the theme “Science Communication & Science Literature – Networking Science & Society”, the *International Science Literature Festival – Vigyanika* will deliberate on the challenges of science communication and also critically evaluate scientific literature and many other issues through Keynote Lectures, Panel Discussions, Scientific Sessions, and Vigyan Kavi Sammelan. The other features of *Vigyanika* would include Virtual Science Book Fair, National Science Song Making Competition, and National Essay Writing Competition on “Leveraging S&T for Self-reliance and Global Welfare”.

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Mega Science Technology and Industry Expo

The India International Science Festival (IISF) 2020 hosts a Mega Science Technology and Industry Expo, which will be the Global Largest Virtual Science Expo to showcase the achievements and success stories of India in the field of Science, Technology, Industry and Management. The top Indian Scientific/Academic Organizations, R&D Labs, PSUs and Indian Industry will participate through Virtual Platform and display their contributions in making India an “Atma Nirbhar Bharat”. IISF 2020 Expo will showcase various initiatives started by Hon’ble Prime Minister in the last 6 Years – missions like Swachh Bharat, Digital India, Skill India, Make in India, etc.

A special focus will be on the Covid-19 preventive activities being done by various Ministries and Departments of the Govt. of India and State Governments.

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National Science Teachers Congress

National Science Teachers Congress was established for inspiring teachers of primary to higher education across the country in various aspects of teaching-learning process and to develop effective tools for comprehensive and continuous science learning. The effort will to inculcate the spirit amongst 1500 teachers empowering them to look for mastering profound and extended impact on society by using innovative teaching modules. This year's target would be realized with humble contributions by NSTC participants.

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National Social Organisation & Institutions Meet

With its theme "Technology interventions and entrepreneurship to achieve self-reliance & community development models", this event is aimed at bringing together science-oriented social organizations, research & academic Institutions, social entrepreneurs, social researchers and workers especially grassroots voluntary developmental organizations engaged in societal development and nation building through the intervention of science, technology and innovation (STI). This program is being organized with the active support of Vibha Vani India— a National Consortium of Grassroots Developmental Organisations & Scientific Institutions. This year, the focus of IISF-NSOIM shall be on the roadmap for identifying and showcasing developmental models that will help in livelihood improvement through entrepreneurship & technology, as well as self-reliant community development, which is in tune with the Sustainable Development Goals-2030 and the emerging new normal, post COVID-19 pandemic.

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National Start-up Conclave

The National Start-up Conclave is intended to provide a common platform for Start-ups to showcase themselves and also interact with various stakeholders from policymakers to innovators, students and researchers. Several sessions are proposed to be organized as part of the conclave with themes ranging from – Enabling Start-up Ecosystem, Accelerating Technology Entrepreneurship, Propelling Ideation and Incubation, and Start-up Challenges in the Covid-19 Scenario. The speakers and experts for these sessions will be from Start-up ecosystems. Experts from across the country from different domains including Agri, Biomedical, Biotech, Electronics, Robotics, Automation, Agricultural Ancillaries, etc. are expected to participate.

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“The true laboratory is the mind, where behind illusions we uncover the laws of truth”

-Jagadish Chandra Bose



Nav Bharat Nirman - Building of the New India

The initiative of Aatmanirbhar Bharat taken up during the hard times of Covid-19 situation across the globe unlocks opportunities to re-bounce the economy post-pandemic for sustainable development. Under “Nav Bharat Nirman”, we are opening the manifesto to all the ecosystem partners at the National level and all across the borders. Knowledge R&D Institutions, S&T based Organizations, Scientists, Engineers, Agronomists, Farmers, Grass-root Innovators, Social Startups, IT experts, Technologists in Biotechnology and Nanotechnology Sectors, Medical and Environment fields, and other specialists will get opportunities through this platform to share their innovative thought-processes, to address pressing problems. Participants will deliberate on themes, such as Building self-reliant SMART villages for inclusive growth; Promoting innovative ecosystem for organic farming & micro-enterprise creation; Habitat & water resources management; Affordable renewable and clean energy solutions; Nature-based solutions – Resource efficiency & circular economy; Strategic nutrition & health care: Yoga, ancient and Ayurvedic medicines; Climate action plan for sustainable future; Involvement of the young in space research programs; Fostering public-private linkages for promoting social entrepreneurship ecosystem in rural landscape directed towards indigenous & sustainable technologies – empowering community with equity and inclusion.

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New Age Technology Show

The technological advancements have changed our everyday life. Quantum Computing, Cloud Computing, Robotics and Process Automation, Data Science, AR, MR & VR, AI, IoT and Smart Cities are some major facets of New Age Technologies. The New Age Technology Show will showcase the technology development in the various cutting-edge areas.

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North-East Students Conclave

The North-East Students’ Conclave is being organized to instill scientific temperament and curiosity rather than curriculum-based conventional pedagogic tools for the young minds of North-East States of India. The theme for the Conclave will be “*Sustainable Utilization of Natural Resources of North East India for Aatmanirbhar Bhaarat*” focusing on water, minerals, biodiversity (flora and fauna) and their sustainable utilization for socio-economic development in NER.

The Conclave will include Poster Presentation, Elocution Competition, Model and Quiz Competition, Lectures from eminent scientists & interaction, Brainstorming Session towards achieving *Aatmanibharata* through innovation and entrepreneurship development with special reference to North east Region of India.

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Outreach Programme & Satellite Communication Event

It is a pre-launch popularization programme of IISF-2020 in which Government Scientific Institutions and Organizations will organize a one-day programme in virtual mode with a view to propagate and bring awareness about different disciplines of science in a holistic manner. This will be a common platform for students, researchers, social scientists and the user community to have and exchange information and knowledge. The outreach programme will cover Lab tours, Press Meet, Exhibition, Meet the Scientists, Competitions for children and Popular Science Lectures.

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Overseas Ministers & Diplomats Conclave

Global challenges can be addressed and solved collectively through the application of science and technology beyond all barriers. Our recent encounter with the Covid-19 pandemic affirmed the same. This Conclave will focus on providing an excellent opportunity to exchange scientific and technological priorities and challenges with India's key partner countries that can help towards developing a road map of S&T cooperation particularly for addressing R&D in post-Covid era towards self-reliant and global welfare.

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Philosophy and Science

This theme will highlight how our ancient wisdom and thinking gave rise to new ways of understanding the mysteries of nature and also create practical knowledge that contributed to human welfare. The relevance of this in the contemporary context when the world is confronted with various challenges will be showcased under this theme. This theme will include expert talks, students' interactive discussion with experts, competitions like quiz, essay writing, films, poster making, etc. The philosophical foundations of Yoga, Ayurveda, and the interesting engagements that happened with Indian philosophy in the development and understanding of implications of Quantum Physics with Einstein, Bohr, Schrodinger, and Oppenheimer among others and their relevance in new technologies and understanding of nature will be showcased. How this pandemic has shown the need for reset of our approach from structured and reductionist to systematic and holistic which is rooted in Ayurveda, Unani and Siddha will be another important dimension.

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Science and Performing Arts

Human beings express and articulate knowledge, thoughts, culture and history through various art forms. All Indian performing art forms like music, dance, paintings, sculptures, folk arts, etc., have a scientific base of physics, mathematics, chemistry, biology, health science, engineering and many other contemporary scientific areas. Sir C.V. Raman illustrated this aspect of performing arts through his scientific research work in the 1930s.

In 'Science and Performing Arts' event, an effort will be made to explore the logic behind various performing art forms focusing on Vocal, Instrumental Music & Dance in the light of contemporary sciences. This will be an apt platform for scientists, researchers, academicians, artists, performers and students who are willing to peep into the Universe with the help of numerous dimensions of 'Bharatiya Sangeet'. The gathering will also be a platform for

traditional instrument makers to share their methodologies and techniques which can be studied further by the groups of enthusiasts in this domain. This session will be full of enriching lec-dem sessions, panel discussions, deliberations, exhibition of innovations combining science with Indian music, and competitions.

Let's be a part of this musical journey and explore it through scientific approach during IISF2020.

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Science and Technology Media Conclave

Across the world, Covid-19 triggered several unexpected challenges and continues to do so. India managed the pandemic very well and in fact turned many of these challenges into opportunities. The necessity of a self-reliant India manifested into a nationwide mission. As a country, India developed indigenous technologies and tools to battle the pandemic and its associated problems. This has also been the coming-of-age year for the digital media and the power of science communication through digital means. The science and technology media conclave will look at the soaring emergence of digital media and its various avatars. The power of responsible science communication to cope with disasters such as a pandemic will also be the focal point of discussion at the Conclave.

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Science Diplomacy

Science diplomacy is an essential tool of statecraft that uses science and technology to advance national interests. It can advance bilateral cooperation, set agenda on multilateral platforms, address national socio-economic requirements, and play a predominant role in solving global challenges such as pandemics, climate change, health, economy, agriculture, and energy. The Science Diplomacy event aims to congregate top-notch professionals and experts to introduce the attendees to some of the cutting-edge progress that highlights India's successes and future course of action on diplomatic use of science and technology in the Industry 4.0 Era.

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Science Education in India

The growth and progress of the country depends on the progress in science and imbibing scientific values. From antiquity, Indian culture has shown a multidisciplinary and scientific approach in every aspect of the education system through Ayurveda, Yoga, Siddha, archeology, architecture etc. India had the world famous Takshashila (6th century BC), where science education flourished. The proposed forum is expected to bring teachers, decision makers, policy makers, curriculum developers, academicians and institutional representatives who can discuss and suggest radical changes to streamline science education in India. The forum consisting of two-day deliberations, will encompass science education from school to higher and applied science education systems.

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States Science & Technology Ministers Conclave

Centered round the theme “Science for Self-Reliant India and Global Welfare”, the States Science & Technology Ministers Conclave will feature Keynote Lectures, Panel Discussions and release of scientific compendiums.

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Students Science Village

Science education is a prime tool for the development of any nation. The prime goal of Students Science Village is to make students from rural areas familiar about India’s achievements in frontier areas of Science & Technology. The Science Village program is linked to the Pradhan Mantri Sansad Adarsh Gram Yojana (PMSAGY) through which each Member of Parliament will nominate five students and one teacher delegate from their adopted village. The nominated students will be from class 9th to 11th accompanied by at least one teacher. In this mega Virtual Online event, participating students and teachers will have opportunities of interaction with eminent scientists and be responsive to the innovative and scientific solutions for the challenges facing the society, particularly rural India.

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Students Engineering Model Competition

SEMC-2020 event will provide students a launch-pad for new initiatives and expanding existing programs to foster innovation, bridge the gap between basic and applied science, and to look for opportunities to move discoveries from the laboratory/workshop to the marketplace. Students would be prompted to adopt Pasteur’s 2nd quadrant approach, which is User Inspired Basic Research, a confluence of new knowledge and application. Entries would be invited online from 3 categories of students, namely Engineering (B.Tech/M.Tech/Polytechnique/ITI), Non Engineering students (Basic science, etc) and International students. Entries will be called in five themes: Digital Bharat, Self-reliant Bharat, Swachha Bharat, Swastha Bharat, AgriTek.

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“A scientist does not belong to a particular nation. He belongs to the whole world. The doors of science should be kept open to all those who work for the welfare of humanity.”

–Homi Jehangir Bhabha

Traditional Crafts and Artisan Meet & Expo

This event will be a National level Virtual Meet/Conference and Expo, emphasizing the science behind the traditional Indian Art and Crafts, their history, technological and policy interventions to improve the quality of handicrafts and the life of the artisans, future prospects, etc. The event shall throw light on implementation and developmental activities of primitive tribes of the country like Bharia, Agaria and many more. Major focus would include the use of natural fibres such as sisal for rural employment and income generation. The Expo will have live streaming and demonstration for extraction and processing of the fibre, yarn and rope making, handicrafts and other products. The programme will bring together traditional craftsmen and artisans, researchers and scientists, entrepreneurs, cottage industries, Self Help Groups, policy makers, and students to discuss about the improvement in traditional crafts to make them globally competitive for augmenting Atma Nirbharta (Self-Sufficiency).

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Vigyan Yatra

As part of promotional activities of IISF 2020 a yatra of the mobile science exhibition van will be flagged off from three cities. The motive would be to ignite the minds of the viewers. The science exhibition mobile van can be viewed by all local school/university students, creating an interest and generating awareness about the IISF 2020. Eminent science communicators, innovators, teachers, students and research scholars of the locality will be felicitated. During the yatra IISF leaflet will also be distributed. LED wall van will display and show promotional videos related to IISF.

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Waste Management and Sanitation

The current thought process related to sustainable sanitation and waste management is about 'resource efficiency', 'closing the nutrient cycle' and 'climate compliant'. These concepts have given rise to the opportunities of utilisation of waste, leading to entrepreneurship opportunities. With these insights, the objective of the "Waste and Sanitation" theme is to provide stimulus for research and innovation for sanitation solutions which dives deep into recycling of wastes with energy recovery, faecal sludge management through self-reliant resilient systems, wastewater management and resource recovery processes.

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Water Segment

Water is an essential prerequisite for development and growth. In fact, all civilizations have evolved around water. Continuously increasing pressure on the fresh water resources is becoming the cause of several problems such as depleting quantity & quality of water resources, severe drought conditions, damage to ecosystems and decreasing economic development. Proper management, conservation and augmentation of water resources are required to secure the sustainable use of water resources. The IISF 2020 segment on water is an engagement platform for students, researchers, academicians, businesses, industry, civil society and policy makers for celebrating water science for societal development, nation building and Aatma Nirbhar Bharat Mission.

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Wellness Conclave

The Wellness Conclave is aimed at propagating health as the wellness of one's body, mind, intellect and society and aligned with the UN sustainable development goal (SDG)-Good Health and Well Being. The event has two components. In the conclave section, eminent speakers will be invited to speak on various topics related to AYUSH systems of medicine, holistic health, metabolic, respiratory and immune wellness. Also, plenary discussions will highlight on various components of the medicinal system. In the exposition section, students pursuing graduation, post-graduation, doctoral or post-doctoral studies in relevant fields will be invited to submit research-based e-poster/model/projects (virtual mode). The day will proceed with mind warming discussions by experts on holistic health and wellness on a wider spectrum and give a sense of how to work toward optimal wellness.

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Women Scientists & Entrepreneurs Conclave

Gender parity is a global concern and worldwide countries are acknowledging the drawbacks of gender imbalance in sustainable growth and development. One of the pillars for achieving self-reliance is accelerating gender equality by including more women in science, technology and innovation (STI). This year, in the present global pandemic situation when the world is going through a major crisis, the role that women in STI can play to build Aatmanirbhar Bharat is imperative. Hence, this year's theme of the Women Scientists & Entrepreneurs Conclave 2020 will be "Role of Women in Aatmanirbhar Bharat" considering women in India have been an integral part of National development. This conclave will aim at converging the diverged women power in several ways; by channelizing the traditional wisdom into knowledge, converting the heritage artisanship into entrepreneurship, etc. This will be achieved through deliberations, case-studies and interactions with young and senior women scientists and entrepreneurs as well as grass-root women workers and innovators.

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Young Scientists Conference (YSC)

The Young Scientists' Conference (YSC) is an opportunity to bring all young and energetic scientific minds on a single platform to present their research and experiences. The primary aim of YSC is to promote the seamless exchange of scientific knowledge among young scientists, researchers, faculty members, science innovators, and professionals from national laboratories, academic institutions, and industry. Researchers along with Postdoctoral and Doctoral research fellows, MSc & B-Tech students below the age of 45 are invited to participate in this scientific conference. It will expose the young scientists towards the interdisciplinary approach of natural sciences and engineering in solving India-centric problems of energy, climate, health, agriculture and of other areas of applied sciences. It would also provide an opportunity to discuss frontier areas of basic sciences, such as Science & Technology for Self-Reliant India; Research & Innovation to Combat Pandemic & Crisis; Frontier Areas of Basic and Applied Research; Research on Artificial Intelligence, Quantum Computation, Robotics and Applications; Science & Technology in Rural Planning.

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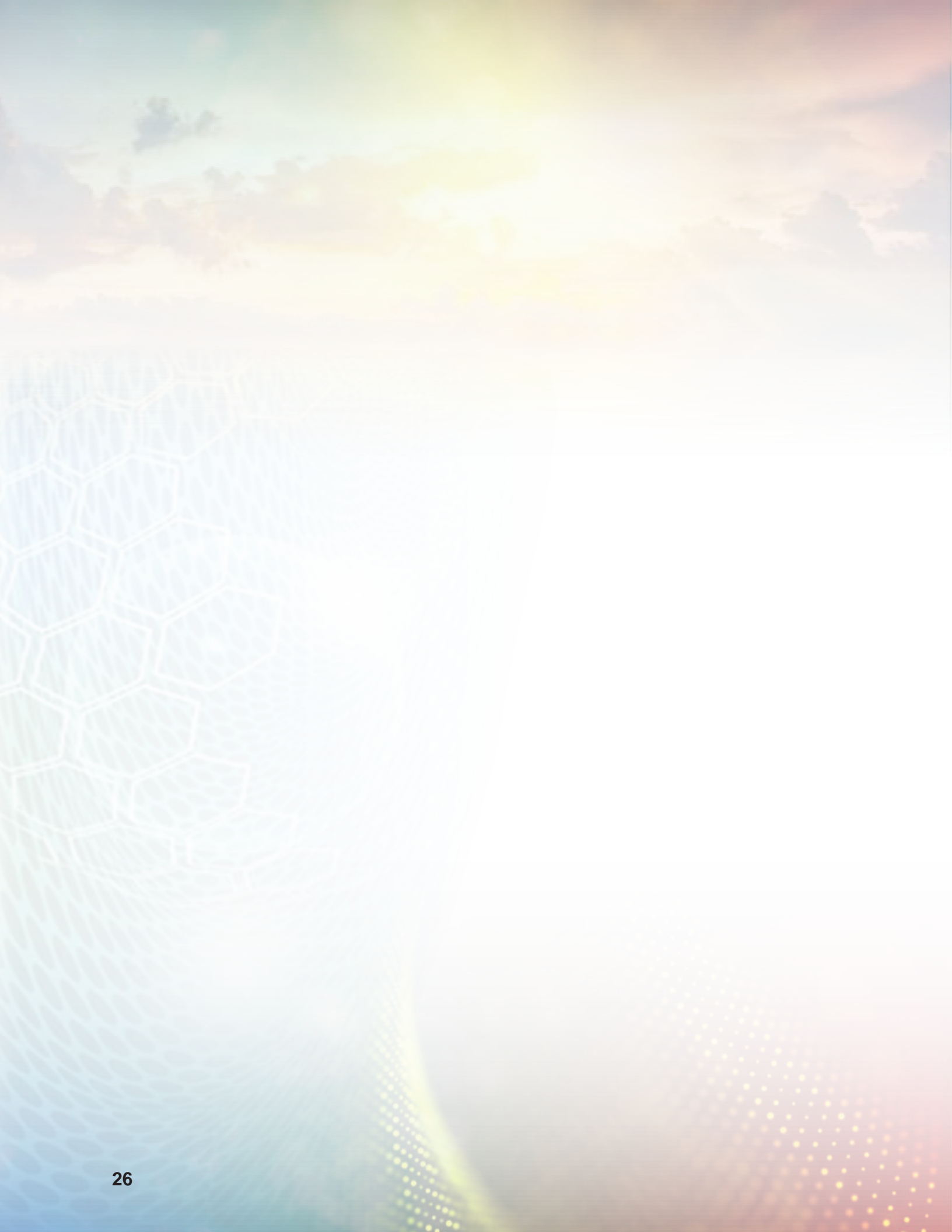
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