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11 TO 15 FEBRUARY 2024

Compiled by Science Communication and Dissemination Directorate (SCDD), CSIR, Anusandhan Bhawan, New Delhi

Cipla partners with CSIR-CDRI to develop formulation for fungal keratitis

CSIR-CDRI 15th February, 2024

Drug major Cipla on Thursday said it has tied up with CSIR-Central Drug Research Institute to jointly develop a novel ophthalmic formulation for fungal keratitis. The collaboration aims to leverage the combined expertise and resources of both organisations to develop a safe and efficacious drug for fungal keratitis, the Mumbai-based drug maker said in a statement.

Globally, around 1.2 million cases of fungal keratitis are reported every year with tropical countries recording a higher incidence.

Fungal keratitis often occurs following ocular trauma and exposure to fungal pathogens from organic matter, thus putting agricultural workers at greater risk. Other risk factors include the use of local steroid eye drops, injury, poor personal hygiene and regular contact lens wear.

Left untreated, the condition can result in corneal destruction, leading to a profound loss of vision. CSIR-CDRI has developed a prototype formulation for an anti-fungal drug to optimise its delivery in the eye.

In pre-clinical studies, this formulation supports faster resolution of the infection. Cipla will scale up the product, conduct the required studies and seek regulatory approvals for commercialisation, ensuring accessibility for those in need, according to the statement.

"Our research focuses on finding innovative, cost-effective solutions for India's unmet clinical needs. CDRI scientists have developed a unique ophthalmic formulation of the anti-fungal drug," CSIR-CDRI Director Radha Rangarajan said.

Published in:
Economictimes

Special flowers to bloom at Puri temple for rituals

CSIR-NBRI

15th February , 2024

The flowers offered at much revered Puri's Jagannath temple will soon be grown with help from Lucknow-based CSIR National Botanical Research Institute.

As per a memorandum of understanding (MoU) signed between the two parties, Lucknow-based research institute will help the Odisha temple in growing special flowers such as lotus, Gandhraj and other aromatic plants needed for rituals.

The flowers will be grown in around 13 acres of temple land. It will not be the first such holy assignment for tyhe NBRI, which had recently developed 'Namoh', a lotus with 108 petals.
"We have been developing flower clusters near temples like Goraknath in UP, Shirdi temple in Maharashtra, Kashi Vishwanath in Varanasi and Meenakshi temple in Madurai, Tamil Nadu," NBRI director Ajit Kumar Shasany. "Since devotees are not allowed to offer flowers bought from outside to deities, the offering for the rituals are grown on the land owned by the temple.

At present, the supply of flowers and plants used at the temple is insufficient to meet such a large need hence NBRI will teach them techniques on how to cultivate aromatic plants and get full bloom in flowering plants," said Shasany under whose guidance the institute had recently launched Jasmine cultivation at Puri temple land.

He said that the institute will also teach Puri temple staff the techniques for growing specific plants like Marjoram, Davana and others used for rituals.

The temple has given already allotted NBRI a piece of 13 acres of land for the purpose. "The temple authorities had planted flowers and plants on this land but failed to give the desired

result. Now, the task will be achieved with NBRI providing hand holding support to the temple staff," said the director.

He said that while land and labour will be of the temple, the NBRI will provide good quality genotype plants of Gandhraj, Jasmine and Marigold to them. "We are also developing flower clusters in nearby villages from where temple authorities can also meet their present and future need.

We plan to train gardeners of the temple to make them independent in flower cultivation," he added. "Since lotus is also offered as part of the prayer, we will also help them grow 'Namoh lotus' at the temple site," he added.

Published in:
Times of India

CKP Kendriya Vidyalaya students visit CSIR-NML Jamshedpur

CSIR-NML

14th February , 2024

CSIR-National Metallurgical Laboratory (NML), Jamshedpur organized a laboratory visit of 139 Chakradharpur Kendriya Vidyalaya students accompanied by seven teachers with the objective to promote scientific awareness and Energy literacy among school students and by exposing them to the world of scientific research and innovation. This program was organized under the CSIR-Jigyasa Virtual Laboratory project. The welcome address was delivered by Dr. Sandip Ghosh Chowdhury, Chief Scientist & Head of MTE Division, CSIR-NML. He welcomed all present in the program and briefly mentioned the contribution of CSIR to the development of the nation through various technological developments and pioneering work.

Dr. Animesh Jana, Senior Scientist, discussed the importance of CSIR-NML, research, and development activities in CSIR Laboratory. Dr. Jana also talked about the aim of the Jigyasa Program and the different activities of the program. He also highlighted the importance of Energy literacy training. The program included visits to some research laboratories like Library, AAC, Melting, Museum, and followed by the demonstration of Do It Yourself (DIY) Kits. A popular lecture series talk was arranged for massive scientific awareness. Dr. K Gopala Krishna, Chief Scientist, MTE division, CSIR-NML, delivered a talk on 'A Predictive Look into Futuristic Living' in the lecture series. The program concluded with a vote of thanks and group Photography session.

Published in:
Avenuemail

International Conference on Traditional Medicines at IIIM from Feb 16

CSIR-IIIM

14th February , 2024

An international conference will be jointly organised by CSIR-Indian Institute of Integrative Medicine Jammu (IIIM) and Society of Ethnopharmacology (SFE), Kolkata from February 16 to 18, 2024 on the theme 'Ethnopharmacology in Development of Phytopharmaceutical Drugs.'

Dr. Zabeer Ahmed, Director CSIR-IIIM and Organising Chairman of the Conference informed that Dr. Jitendra Singh, Union MoS (Independent Charge) Science & Technology; MoS PMO, Atomic Energy and Space and Vice President CSIR has consented to be the chief guest at inaugural function.

Padma Shri Prof. Vinod K Singh, Chair Professor, Department of Chemistry, IIT Kanpur, Chairman, CSIR-RAB and Mentor of CSIR-IIIM from amongst CSIR Society, Dr. N Kalaiselvi, Director General CSIR & Secretary to Govt of India, DSIR will be guests of honour.

Dr. Ahmed said that many distinguished scientists, technologists, policy makers, industry people, academicians, clinicians, researchers, students from all over India and abroad are expected to participate in the Conference.

"More than 20 sessions have been planned for the Conference on themes like 'Development of Phytopharmaceutical Drugs: Tradition to Translational', 'Young Ethnopharmacologist Award Function', 'American Chemical Society Best Oral Presentation Award Session', 'SFE Best Poster Presentation Session', panel discussion on 'Opportunities and Challenges in Cannabis

Research' and Traditional Healers Meet, etc" he maintained. IIIM Director also said that other scientific sessions would be on themes 'Phytopharmaceuticals: Drug Development from Traditional Medicine', 'Evidence-Based Validation of Traditional Medicine', 'Traditional Ethnopharmacology Inspired Drug Discovery and Development' etc.

He said that more than 100 distinguished invited speakers from about 20 countries including United States of America, United Kingdom, Australia, Italy, Malaysia, Thailand, Bangladesh, Ghana and India would be delivering their talks while about 700 participants from all over India have registered for the mega event.

The international conference is being organized under the overall supervision of Dr. Zabeer Ahmed, Director CSIR-IIIM and the organizing Chairman for the Conference while Dr. Prasoon K. Gupta and Dr. Naveed Qazi are organizing secretaries.

Dr. Pulok K. Mukherjee, Chairman, Scientific Services SFEC-2024, Dr. Subhash C Mandal, Secretary SFE, Birendra Kumar Sarkar, President SFE, Dr. CK Katiyar, Vice President SFE, Indraneel Das, Vice President, SFE, Dr. Amit Kar, Treasurer SFE, Dr. Vikash Babu, Treasurer and members of S&T staff of CSIR-IIIM are included in the Organising Committee for the event.

Published in:
Dailyexcelsior

Why India wants to develop high-altitude pseudo-satellite vehicles, powered by the Sun

CSIR-NAL 14th February, 2024

Last week, the Bengaluru-based National Aerospace Laboratories (NAL) successfully flew a prototype of a new-generation unmanned aerial vehicle (UAV) that is being seen as a huge technology breakthrough. It was no ordinary UAV. This one can fly at great heights, about 20 km from ground, runs entirely on solar power, and can remain in the air for months on end. Such UAVs belong to a class of flying objects called HAPS, or high-altitude pseudo-satellite vehicles, or HALE, that is high-altitude long-endurance vehicles.

The primary utility of HAPS vehicles is in the field of surveillance and monitoring, but there are other situations, like disaster management, wherein it can be very useful.

HAPS technology is still under development. Several countries, and companies, have developed and flown such vehicles with encouraging success, but none has mastered the technology yet. The world record for a vehicle of this class is held by the Airbus-manufactured Zephyr, which flew continuously for 64 days in August 2022 before crashing.

The prototype tested by NAL last week spent eight and a half hours in the air. Next month, NAL, a unit of the Council of Scientific and Industrial Research (CSIR), plans to keep it in flight for at least 24 hours. The full-scale machine that NAL is trying to build, by 2027, would be aiming to remain in the air for 90 days at a stretch.

What is the need for such UAVs?

The kind of jobs that HAPS are meant to do are currently done by UAVs and satellites, but both have certain limitations. The normal UAVs, or drones as they are commonly called, are mostly battery-powered and cannot remain in the air beyond a few hours. Continuous monitoring is not something these can do very effectively. In addition, they fly at relatively low levels, because of which their vision is restricted to small areas.

Satellites can observe much larger areas, but the ones in low-earth orbits are continuously moving with respect to Earth. They cannot be constantly keeping an eye on the target area. Geostationary satellites, located at a height of about 36,000 km above the ground, can keep a constant gaze over one area. But these are fairly expensive, and once deployed, cannot be repurposed or reoriented.

HAPS are meant to overcome all these shortcomings, and do more.

"These stratospheric vehicles (flying about 20 km above the ground) are designed to loiter over a region. By standards of flying objects, and in comparison to UAVs for example, they move really slow, at just about 80-100 km per hour. That kind of slow speed 20 km above the ground means that objects on the ground pretty much don't move for it. You can easily keep an eye over 200 sq km of area. In fact, you can observe everything even over a 400 sq km area with a five metre resolution. If you want to focus only at one sq km, for example, you can get a resolution as high as 15 cm," said Dr L Venkatakrishnan, chief scientist and head of Experimental Aerodynamics Division at NAL, who is leading the development of HAPS.

"HAPS can be a very powerful solution for this kind of work. They work like geostationary satellites but with added flexibility. They can be easily redeployed over another location, or can be reequipped with a different payload, something that is not possible with a geostationary satellite," Venkatakrishnan said.

Engineering challenges of HAPS

But developing an autonomous flying machine fuelled entirely by solar power and capable of remaining in the air for months faces major technological hurdles. That is the reason why, despite decades of work, a full-fledged HAPS vehicle has still eluded engineers. It is only now, with advanced technologies in solar cells, batteries and composite materials, that this vehicle looks possible in the near future.

The primary challenge is to generate enough solar power to keep the aircraft flying, the payloads operating, and the batteries charging. The batteries need to be enough to continue the operations

through the night. Then there are design-related challenges. The aircraft needs to be extremely lightweight to minimise the power requirement, but it also has to be stable.

This is one of the reasons why this aircraft is meant to fly in the stratosphere. The region between 17 and 23 km above the earth's surface is climatologically conducive for their flight. The wind speed is very low and ideal for light-weight aircraft to remain stable. It helps that this height, much above the region in which civilian aircraft fly, is favourable for observation and surveillance activities.

But temperatures at that height can drop to -50 degree Celsius or lower. Electronics need to be kept warmer, and that is an additional burden on power resources. Also, air density is just about 7 per cent of what it is at sea level. That creates acute complications for the aircraft, for example in producing lift and thrust.

Because of limitations of space and weight, solar cells and batteries need to have very high efficiencies. For example, Venkatakrishnan said they were looking at battery cells with an energy density of 500 watt-hour/kg. Energy density is a measure of the amount of energy stored in a battery in proportion to its weight.

For perspective, an average truck battery has an energy density of 75 watt-hour/kg, most of the satellites sent by the Indian Space Research Organisation (ISRO) have batteries with an energy density of about 190-200 watt-hour/kg, and even Tesla, one of the most advanced car companies, was right now working with energy densities in the range of 240-260 watt-hour/kg, he said.

"With HAPS, we are testing the limits of present technology. There is one company which has achieved 500 watt-hour/kg, and the battery is commercially available, even though extremely expensive. Even with other aspects of this aircraft, for example, design, materials, aerodynamics and aeroelasticity, we are working at the limits of technology. HAPS is the grand engineering challenge of aviation right now," Venkatakrishnan said.

India and the HAPS

For India, HAPS is another technology area where it is entering the race at a relatively early stage. In the last few years, there has been great emphasis on promoting research in emerging technologies, so that the country is not dependent on others for critical technologies of the future. Joining technology development at an early stage also results in capacity building, early adoption of technologies, control over patents, business opportunities and spin-off technologies.

Venkatakrishnan said India had moved into HAPS technology development at the right time, and the successful test flight showed that it had capabilities similar to some of the other countries trying to develop this technology.

"We are not playing catch-up. We are not the leaders, for sure, at this moment, but we can confidently say that we have lead runners firmly in sight. We are very much in the race," he said.

"For example, none of the advanced HAPS options, including Zephyr, has flown in tropical areas, which offer a much bigger challenge, because of the presence of jet streams in upper atmosphere. We probably have an advantage here," he said.

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Union Minister for Science & Technology, Dr Jitendra Singh convenes the monthly joint meeting of different Science Ministries and Departments;

CSIR

11th February , 2024

Union Minister for Science & Technology, Dr Jitendra Singh today convened the monthly joint meeting of different Science Ministries and Departments, in New Delhi, wherein among other agenda items, he reviewed the Space Hackathon held last month for the students to sharpen their skills and innovation.

The 30-hour hackathon on Space related challenges like technical issues related to the Geospatial BHUVAN portal was organised as part of the India International Science Festival - 2023 (IISF-2023) held at the DBT THSTI - RCB Campus in Faridabad, Haryana from 17th to 20th January 2024.

Expressing satisfaction at the huge response for the first of its kind Space hackathon, the S&T Minister appreciated the fact that over 4,000 teams were registered in the span of one month. 57 teams were shortlisted for the grand finale at Faridabad.

The high-level joint meeting of different Science Ministries and Departments included representatives from Science & Technology, Biotechnology, CSIR, Earth Sciences, Dept. of Space and Atomic Energy.

The S&T Minister was informed that after the conclusion of a gruelling 30-hour hackathon at the IISF venue, initial jury shortlisted the top 24 teams. Main jury selected 16 teams for the pitch presentation, and finally four teams were declared winners and their ideas will be supported by ISRO. Besides, 11 runners up were also declared.

Dr Jitendra Singh also commended all the scientific departments for the grand success of the IISF-2023 that saw close to 35,000 participants including more than 11,000 delegates. Seven State S&T Ministers, 27 State officials and Secretaries and 75 delegates also participated in the four-day Science Fest.

The Science Secretaries monthly meeting also lauded the Departments for the ground work involved in the operationalization of the Anusandhan National Research Foundation (NRF) with its issue of notification on 5th February 2024. Dr Jitendra Singh suggested that DST could go for the search of Anusandhan NRF Logo.

Dr Jitendra Singh was informed that a demonstration was held for the One portal being designed for all fellowships of various Science Departments. A Security Audit of the portal is now being conducted by NIC before it is launched for the scholars.

The meeting also discussed a proposal for Service conditions of Research Scientists in various Government Departments and Institutions.

Dr Jitendra Singh called for mobilization of the recently set up Science Media Communication Center (SMCC) to raise awareness about new achievements and discoveries/inventions. He directed a Workshop of all Nodal Officers of Laboratories and Departments be held for easier flow of newsworthy achievements.

The S&T Minister was informed that Brazil, being the G20 Presidency host this year, has called for drafts to formulate the G20 Bioeconomy Initiative and the first Experts Meeting will be held on 13-14 March in Brazil.

Today's meeting was held as part of the monthly review meetings of Science Secretaries, initiated by Dr Jitendra Singh in order to break the silos and evolve a synergistic integrated approach among different scientific streams.

Principal Scientific Advisor to Government of India, Dr Ajay K Sood; Secretary, DSIR & DG, CSIR, Dr N Kalaiselvi; Secretary, DST, Prof. Abhay Karandikar; Secretary, DBT, Dr Rajesh S Gokhale; & Secretary, Ministry of Earth Sciences, Dr M Ravichandran attended the deliberations.

Senior Officers of the Science Ministries and Departments, including Science & Technology, Biotechnology, CSIR, Earth Sciences, ISRO and Atomic Energy were also present.

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'SWATI' (Science for Women-A Technology & Innovation) Portal launched in New Delhi to create a single online portal representing Indian Women and Girls in STEMM (Science, Technology, Engineering, Mathematics & Medicine)

CSIR

11th February , 2024

Principal Scientific Advisor to the Government of India Prof Ajay Kumar Sood today launched "Science for Women-A Technology & Innovation (SWATI)" Portal, aimed at creating a single online portal representing Indian Women and Girls in STEMM (Science, Technology, Engineering, Mathematics & Medicine)

Launching the Portal on the occasion of International Day of Women and Girls in Science at Indian National Science Academy (INSA), New Delhi, Prof Sood said, the database of SWATI Portal will serve in policy making to address the challenges of Gender-gap.

The Portal is a complete interactive database; and the first-of-its-kind in India which is developed, hosted and maintained by the National Institute of Plant Genome Research (NIPGR), New Delhi under the leadership of Dr. Subhra Chakraborty, Director, NIPGR, New Delhi; Link to join SWATI: https://bit.ly/JoinSWATI.

Dr Chakraborty in her address highlighted this aspect and said that this probably world's first Interactive Portal of its kind. She also quoted figures of 2021 UN Report to highlight the under representation of women across all sectors.

Dr Chakraborty reiterated that this is a dynamically growing portal and the endeavour is to have data of all women scientists of the country included. Prof. Quarraisha Abdool Karim, President TWAS, in her Keynote Address said that even in 21st Century, we still have way to go to address Gender Parity in all sectors of life. She said, education is a great equalizer and

access to it must be made available to women and girls across all streams. The event was organized with a view to focusing on the importance of "Science for Women & Women in Science" as well as emerging opportunities and inclusiveness of women in S&T endeavours. This will be beneficial towards dissemination of knowledge, new advances in fundamental science and role/importance of innovation and entrepreneurship development in strengthening the backbone of Atmanirbhar Bharat. This would also provide an opportunity to discuss and evolve a roadmap for 'Women in Science' & 'Science for Women'.

The other objectives of the SWATI Portal include to scale up the effort exponentially to include each and every Indian woman in science, across all career stages and subjects, spanning both Academia and the Industry enabling reliable and statistically significant long term research on the issues of equality, diversity and inclusivity in India; Inclusion of each and every Indian WiS, career stages, subjects, spanning both Academia and the Industry; Enabling reliable and statistically significant long term research on the issues of equality, diversity and inclusivity in India, developing active search engine and searchable database (Name, Affiliation, Area of Interest).

The various Sections in the portal include Icons - Awardees (Padma / Shanti Swarup Bhatnagar / Stree Shakti Science Samman) & Directors, Secretaries Academy Presidents; Faculty- Indian Universities, Autonomous organizations including S&T Ministry/ CSIR/ DBT/ DST/ CSIR/ MHRD/ UGC/ GATI/ KIRAN; Research fellows- Post docs, JRFs, SRFs, technical Staff; Students-PhD Scholars, Research Interns, Graduates, Post graduates, Undergraduates; WiS Entrepreneurs, Startups, Business & Science Administrators; STEMM background professionals in alternate careers(e.g. Science, Journalism etc).So far, 3000 'WiS Data Cards' have been incorporated.

The event wwas graced by the distinguished scientists of national/ international repute viz. Prof. CNR Rao, Linus Pauling Research Professor & Hon. President, JNCASR, Bangalore, Prof. P N Tandon, Formerly, Professor & Neurosurgeon, Dept. of Neurosurgery, AIIMS, Former President, NASI; Presidents of the three Science Academies viz. Prof. Balram

Bhargava (President, NASI), Prof. Waghmare (President, IASc), Prof. Ashutosh Sharma (President, INSA),Dr. Manju Sharma, Former Secretary to the Govt. of India, DBT, Prof. Chandrima Shaha, Former President, INSA including other distinguished women scientists viz. Dr. Renu Swarup, Former Secretary to the Govt. of India, DBT; Prof. Rohini Godbole, Vice President, IASc, IISc, Bangalore and Prof, Shobhona Sharma, Former Senior Professor, TIFR Mumbai and Chair, INSA 'Women in Science' Panel; Dr. Soumya Swaminathan, Former DG, ICMR & Chief Scientist, WHO; Prof. Paramjit Khurana, Delhi Unversity, South Campus.

Several eminent speakers/ scientists/entrepreneurs/ start-ups from all across the country have been invited to share their expertise on the subjects of relevance; several young women scientists, researchers, P.G. students, faculty members, technocrats and start-ups from various institutions, universities, PG Colleges as well as the industries all across the country are likely to participate in the event.

With this endeavour of the IAP, a platform would be created to encourage and bring together, all the young women scientists, faculty members, researchers and also the young start-ups from India and abroad under one umbrella for pursuing the cause of Science.

Women constitute, the 50% of human resource, which is vital for the progress of the society. To empower women is to increase their role in the decision-making that affects their lives both within and outside the household. It is important to educate more women especially in the field of science& technology, because science education not only enhances awareness level but also builds a mind-set with an ability to judge between right and wrong. It provides a scientific approach to cope up with the problems being faced by the women, ensuring their socio-economic development. The women scientists can provide opportunities by making them aware on several scientific & societal issues, thus bridging the gender gap and removing the barriers of negativity.

Therefore, realizing the role of women scientists, the Inter-Academy Panel (IAP) of the three Science Academies viz. IASc, NASI and INSA with several distinguished women scientists

from various institutions of repute and representatives from Govt. Departments/Agencies (DST, DBT, DAE, CSIR, ICMR & ISRO), has been working towards promoting gender sensitization, mentorship, gender parity, creating skilled human resource; helping towards the development of rural women and other related areas with the motive to ensure the inclusion of more Women in S&T related issues in all pragmatic ways and strengthen the application of S&T for the welfare of women.

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