

List of Awards

CSIR Foundation Day 2019

G N Ramachandran Gold Medal for Excellence in Biological Sciences & Technology 2019

It has been awarded to Prof. Amitabha Chattopadhyay of CSIR-CCMB (Centre for Cellular and Molecular Biology, Hyderabad) for his outstanding and well recognized contributions in understanding dynamics and lipid-protein interaction in biomembranes

CSIR Diamond Jubilee Technology Award 2017

The award is conferred on Cadila Healthcare Limited for developing ‘Saroglitazar’- World’s first approved drug for treating diabetic dyslipidemia and India’s first indigenously discovered and developed New Chemical Entity (NCE) from a Pharmaceutical Company.

CSIR Diamond Jubilee Technology Award 2018

For the year 2018 the award is conferred on Carborundum Universal Limited for development of Metallized Alumina Ceramics like metallized alumina cylinders for vacuum interrupters / vacuum circuit breakers for electrical applications and other advanced products which require ultra-high vacuum tightness and high bond strength between ceramic – metal joint.

CSIR Innovation Award for School Children-2019

Total eleven innovation proposals selected for award from 653 received and 17 children received the awards.

The first prize went to Anmol Rathi and Harsh Agrawal, students of class Xth of Bhartiya Vidya Bhavan’s R.K. Sarada Vidya Mandir, Raipur for their innovation on “ Novel technique for early detection of PANCREATIC CANCER through spermine level in human saliva”

Winners of CSIR Technology Awards for the Year 2019

The award for Life **Sciences** has been given to CSIR-CDRI for developing ‘A Novel Osteoinductive Molecule S-008-399 as Medicated Biodegradable Bone Implant Material for Fast Fracture-Healing’.

The award in **Innovation Category** goes to CSIR-CSMCRI and M/S Chern Process Systems Private Limited for ‘Zero waste process for recovery of potash fertiliser, water & other value added byproduct(s) from spent wash’

The award for **physical sciences** including engineering went to CSIR-NAL for “Carriage, handling and Strokes release clearance for a fighter Aircraft Upgrade” and CSIR-CIMFR for ‘Controlled blasting techniques developed for safe extraction of minerals from mines and construction of various civil infrastructure projects’

CSIR-CIMFR also bagged the award under Business Development and Technology Marketing Category.

CSIR Young Scientist Awards 2019

Biological Sciences:

The CSIR Young Scientist Award for the year 2019 in Biological Sciences has been awarded to **Dr Bidyut Purkait of CSIR-CDRI** (Central Drug Research Institute, Lucknow) for his valuable contribution for deciphering the mechanism of Amphotericin-B resistance in clinical isolates of *Leishmania donovani* and introduction of the new target from RNA editing machinery for anti-leishmanial therapy.

Dr Lipi Thukral of CSIR-IGIB (Institute of Genomics & Integrative Biology, New Delhi) has also been awarded the CSIR Young Scientist Award for the year 2019 in Biological Sciences for her innovative contributions in use of computer simulation studies to decipher the functional role of coupled protein-lipid dynamics in autophagy.

Chemical Sciences

The CSIR Young Scientist Award for the year 2019 in Chemical Sciences has been awarded to **Dr John Mondal of CSIR-IICT** (Indian Institute of Chemical Technology, Hyderabad), for his outstanding contribution in developing novel Porous Organic Polymers and their application in heterogeneous catalysis.

The CSIR Young Scientist Award for the year 2019 in Chemical Sciences has been awarded to **Dr Sasidhar B.S. of CSIR-NIIST** (National Institute for Interdisciplinary Science and Technology, Thiruvananthapuram), for his significant contribution to organic synthesis, particularly in the area of pharmaceuticals and agrochemicals.

Earth, Atmosphere, Ocean & Planetary Sciences

Dr Amol Prakash of CSIR-NIO (National Institute of Oceanography, Goa), has been awarded for his significant work on explaining the environment observations along the Indian coast and developing a theoretical framework to understand the dynamics of shelf waves and their interaction with large scale circulations

Dr Bodhisatwa Hazra of CSIR-CIMFR (Central Institute of Mining and Fuel Research, Dhanbad), has been awarded for his significant contributions on source-rock geochemistry, gas adsorption and fractal dimensions of organic sedimentary rocks.

Engineering Sciences

Dr Divya Agrawal of CSIR-CSIO (Central Scientific Instruments Organisation, Chandigarh), has been awarded for her significant contributions in developing instrumentation solutions for Situation Awareness Enhancement of Fighter Aircraft Pilots.

Dr Prabhat Ranjan Prem, CSIR-SERC (Structural Engineering Research Centre, Chennai) has been awarded for his outstanding contributions in experimental and theoretical research on ultrahigh-performance concrete.

Physical Sciences (including instrumentation)

The CSIR Young Scientist Award for the year 2019 in Physical Sciences (including instrumentation) has been awarded to **Dr. Shikha of CSIR-CMERI** (Central Mechanical Engineering Research Institute, Durgapur), for developing a novel device for guided tissue traversal during surgical procedures, used for facilitating insertion of needle and its position evaluation.

CSIR Technology Awards 2019

CSIR- Central Drug Research Institute (CSIR-CDRI), Lucknow has won the award for A Novel Osteoinductive Molecule S-008-399 as Medicated Biodegradable Bone Implant Material for Fast Fracture-Healing

Scientists at CSIR-CDRI have designed and developed a novel dual-acting compound CDRI S008-399 that promotes bone formation and prevents bone resorption while leading to faster bone healing, and enhances bone mineral density.

The compound promotes osteoblast differentiation and mineralization at dose as low as one *picomolar* concentration. This bone inducing agent improves bone quality and restores trabecular micro-architecture in ovariectomized osteopenic cases. S008-399 also enhances new bone formation and decreased the level of CTX (beta C-terminal telopeptide), a collagen breakdown product and bone resorption marker. Design, synthesis and extensive biological studies with CDRI-S008-399 established its dual anabolic and anti-catabolic effects in ovariectomized osteopenic Sprague Dawley rats.

Due to its notable osteoinductive properties, the product S008-399 has been licensed and the technology has been transferred for having orthobiologicals to enhance healing at the fracture site. These will also reduce the cost of bone implant surgery and there will be no need for re-surgery either to remove the metallic screws/pins/plates or for some other infections caused by non-degradable implants. Furthermore, the healing will be faster due to potent osteoinductive property of S008-399.

CSIR- Central Salt and Marine Chemicals Research Institute (CSIR-CSMCRI), Bhavnagar has won the award for Zero waste process for recovery of potash fertiliser, water & other value added byproduct(s) from spent wash

This innovation of CSIR-CSMCRI transforms a long-standing environmental concern into an opportunity to achieve a self-reliance. It is a 'Zero Liquid Discharge' compliant W2W technology that generates marketable products from effluent of sugarcane molasses-based distilleries, while water is recovered and recycled. The innovation renders the treated spent wash amenable to a selective K-precipitation technique for recovery of FCO (Fertilizer Control Order) grade potash fertilizer.

CSIR-CSMCRI technology allows remunerative utilization of distillery spent wash through recovery of value-added by products while conforming to 'Zero Waste' concept – a step beyond existing norm. The process is about 20% less energy intensive compared to current practices adopted for similar product portfolio. World's 1st commercial plant to produce FCO-grade potassium nitrate from spent wash, based on this unique technology, has been installed at Walchandnagar, Maharashtra.

Major benefits of the technology are production of indigenous potash fertiliser, conservation of water resources, boosting ethanol production and ethanol blended petrol, reduction in potash import, augmented income for farmer, industry and government. Adoption of this globally unique technology is to improve the operational, financial and ecological sustainability of Indian distillery sector.

CSIR-Central Institute of Mining and Fuel Research, Dhanbad has won the award jointly for Controlled blasting techniques developed for safe extraction of minerals from mines and construction of various civil infrastructure projects

CSIR-CIMFR is playing a vital role in the domain of rock blasting research, spanning from exploratory research to updating the national methodology for excavation of minerals. It has developed and implemented the controlled blasting technique of pre-splitting for Indian mining operations. The successful execution of this technique facilitated Rampura Agucha Mine to be India's deepest open-pit mine. The technique has been used first time in India for dragline benches at Moher and Moher- Amlohri Extension Open cast and helped the mine management to produce the electricity at the low-priced rate. The inventors have implemented controlled blasting technique and rock excavation methods for more than 500 coal and metal mines and more than 30 prestigious hydroelectric and civil construction projects.

The multi-ring blasting technology has been designed and experimented in Sindesar Khurd and Kayad underground mine which focuses on enhancement of productivity from the stopes along-with minimisation of blast vibration near surface and underground structures. Mine-to-Mill technology developed by the inventors has helped in efficient utilisation of explosives energy for reduction in downstream operational cost of the mine. CSIR-CIMFR has designed the land development sequences for flattening of 92 m height Ulwe hill at the ambitious Greenfield Project of Navi Mumbai International Airport, without causing any inconvenience as well as any future instability. Apart from the flattening of Ulwe hill, river diversion channel has successfully been completed in stipulated time.

CSIR- National Aerospace Laboratories (CSIR-NAL), Bengaluru has won the award jointly for Carriage, Handling and Stores Release Clearance Studies for a Fighter Aircraft Upgrade

CSIR-NAL was actively involved in upgradation of a series of frontline fighter aircrafts of Indian Air Force inventory. The series has both fighter and trainer variants with nearly identical combat and air-to-air refueling capabilities. Although inducted in late 80's, the upgrades have played a pivotal role in current encounters with specific targets. The aircrafts were upgraded recently with multi-mission air-to-air beyond visual range projectile system, fire control *radars*, night vision compatible cockpit, advanced navigational systems, advanced Identification friend or foe system, advanced multi-mode multi-layered radar and fully integrated electronic warfare suite as part of the initial operating clearance.

CSIR-NAL participated in the overall Final Operational Clearance for the aircrafts and provided in-house technological support for structural integrity, stability, control and aero-mechanical clearance of new stores including armament configurations in combination with other stores such as 'new generation precision guided munitions' (Spice-2000 etc.). The novelty of the technology is that it does not require design data or finite element model for fixing critical configurations.

CSIR-Central Institute of Mining and Fuel Research, Dhanbad has won the award for Significantly Enhancing the Business and Marketing of their Knowledgebase

CSIR-CIMFR, based on its scientific investigations, has pioneered in providing technical and advisory services, to its stakeholders in the areas of mining, hydroelectric and tunneling. The laboratory has been supporting in solving complex mining problems and also in operation of more than 400 coal and metal mines and more than 20 prominent hydroelectric projects. In addition, blast optimization and safety related subjects pertaining to quarrying, tunneling, metal

cladding, railway tracks and over bridges and construction sites have been undertaken and solved by CSIR-CIMFR.

The clientele of the laboratory including user industries have been immensely benefited in terms of safety and productivity from the R&D solutions provided. CSIR-CIMFR has exerted a continuous effort to add new clients by organizing several sessions, and industry meets, and operationalizing new business mechanisms. The recent state-of-the-art contribution from its Rock Excavation Engineering division is extraordinary. These have led to a sustainable and consistent growth of over multi fold increase in its External Cash Flow (ECF) in a period of last five years and makes the laboratory as the top most earner of ECF amongst all CSIR laboratories.

CSIR Young Scientist Awards 2019

Biological Sciences



Dr Bidyut Purkait

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Dr Lipi Thukral

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Chemical Sciences



Dr John Mondal

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Dr Sasidhar B.S.

The CSIR Young Scientist Award for the year 2019 in Chemical Sciences has been awarded to Dr Sasidhar B.S. of CSIR National Institute for Interdisciplinary Science and Technology, Thiruvananthapuram, for his significant contribution to organic synthesis, particularly in the area of pharmaceuticals and agrochemicals.

Earth, Atmosphere, Ocean & Planetary Sciences



Dr Amol Prakash

The CSIR Young Scientist Award for the year 2019 in Earth, Atmosphere, Ocean and Planetary Sciences has been awarded Dr Amol Prakash of CSIR National Institute of Oceanography, Goa, for his significant work on explaining the environment observations along the Indian coast and developing a theoretical framework to understand the dynamics of shelf waves and their interaction with large scale circulations.



Dr Bodhisatwa Hazra

The CSIR Young Scientist Award for the year 2019 in Earth, Atmosphere, Ocean and Planetary Sciences has been awarded to Dr Bodhisatwa Hazra of CSIR Central Institute of Mining and Fuel Research, Dhanbad, for his significant contributions on source-rock geochemistry, gas adsorption and fractal dimensions of organic sedimentary rocks.

Engineering Sciences



Dr Divya Agrawal

The CSIR Young Scientist Award for the year 2019 in Engineering Sciences has been awarded to Dr Divya Agrawal of CSIR Central Scientific Instruments Organisation, Chandigarh, for her significant contributions in developing instrumentation solutions for Situation Awareness Enhancement of Fighter Aircraft Pilots.



Dr Prabhat Ranjan Prem

The CSIR Young Scientist Award for the year 2019 in Engineering Sciences has been awarded to Dr Prabhat Ranjan Prem, CSIR Structural Engineering Research Centre, Chennai, for his outstanding contributions in experimental and theoretical research on ultrahigh-performance concrete.

Physical Sciences (including instrumentation)



Dr Shikha

The CSIR Young Scientist Award for the year 2019 in Physical Sciences (including instrumentation) has been awarded to Dr. Shikha of CSIR Central Mechanical Engineering Research Institute, Durgapur, for developing a novel device for guided tissue traversal during surgical procedures, used for facilitating insertion of needle and its position evaluation.

CSIR Innovation Award for School Children-2019

CSIR announced Diamond Jubilee Invention Award for School Children on 26 April, 2002 in order to enhance creativity amongst school children. The day is also celebrated as 'WORLD INTELLECTUAL PROPERTY DAY' throughout the world. The objectives of this competition are to capture creativity and innovativeness amongst school children and create awareness about IPR. From the year 2011 the Award is renamed as CSIR Innovation Award for School Children.

During the last sixteen years, i.e. from 2002 to 2019, 6,644 proposals were received for these Awards from various parts of the country and 125 inventions/innovations were selected for various prizes by High Level Awards Selection Committee.

In the year 2016-2019 the competition has been renewed with an intervening training cum awareness programme. This year 2019, CSIR received 653 innovation proposals which were screened. Total eleven innovation proposals selected for award. The award comprises a cash prize, trophy and a certificate. The following 17 children awarded for their 11 innovations contains total one 1st prize, two 2nd prizes, three 3rd prizes, four fourth prizes and one fifth prize:-

First prize ₹ 1,00,000/-

NO. OF PRIZES :- one

Novel technique for early detection of PANCREATIC CANCER through spermine level in human saliva



Anmol Rathi and **Harsh Agrawal**, students of class Xth of Bhartiya Vidya Bhavan's R.K. Sarda Vidya Mandir, Raipur, have found a novel, non-invasive and a cheap procedure to detect world's one of the most deadliest pancreatic cancer. This procedure is based on a Lateral Flow Assay system which quantifies the concentration of Spermine in saliva.

The results are obtained on the basis of concentration level of Spermine i.e. a concentration above the desired threshold shows a positive result while a concentration below the threshold

shows a negative result. Also, a mobile application was developed by the team in order to classify the test results as negatives, positives or invalid.

Second prize ₹ 50,000/- each

NO. OF PRIZES :- TWO

INTEGRATED GRIDDLE / SKILLET WITH ROASTER FOR MAKING CHAPATTI



Rajashree Choudhary, a student of class XI of V.B.C.V.

Jamshedpur, Jharkhand, has designed a skillet/tawa equipped with a roaster that will be useful in conserving the heat lost during the stage of puffing chapattis. The skillet/tawa is made up of seven pieces of alloy steel strips and attached with a frame to open it. It has been observed that almost 30% of heat is lost at this particular

stage of making chapattis. The Integrated-Griddle consists of a handle which can be rotated and further be converted into a roaster thereby minimizing the heat loss. Thus, it is a very basic yet an affordable skillet to minimize heat loss while cooking.

A NANO SOLUTION TO GIGA-NANO PROBLEMS



Eshan Bajaj, a student of class XIIth of D.A.V. International School, Khargar, Navi Mumbai has developed a novel hydrophobic solution which consists of chemicals such as stearic acid, ethanol and SiO₂. This solution is further used as a coating on the surfaces of materials used at public conveniences. Thus, any liquid placed on the super *hydrophobic* coating is repelled and simply rolls off without touching

the underlying *surface*. This will save more than 12,000 litres of water per person, per year.

Third Prize ₹ 30,000/-each

NO. OF PRIZES:- THREE

GREEN DESERT



Sherub Arora, a student of class IXth of Nosegay Public School, Sri Ganganagar, Rajasthan, has designed a very simple yet a very useful water battery to harvest rain water. Each water battery has the holding capacity of 17 L. It is made up of waste plastic buckets with lids, a fishnet thread and vertical tunnel constructed at the bottom. The water-filled reservoir releases small amount (approx. 50 ml per day) of water into the

ground via the fishnet thread to the roots of the trees thus, encouraging the trees to develop better roots. Inventions like these can be carried out on a large scale especially in the drought-hit regions.

SMART FEEDING SPOON FOR PARKINSON PATIENTS



Eshan Bhatta, a student of class Xth of Anand Niketan Maninagar Campus, Ahmedabad, has designed a feeding spoon that will help millions of Parkinson affected patients in being self-reliant. A spoon of such a kind is not merely an electronic spoon but a tool that could give them their dignity and self-respect back. Thus, making them self-reliant. The designed spoon comprises of S90 servo motors, Gy521 tilt sensors, jumper wires, bread board, 9V power source, hand gloves and a little micro controller (Arduino Uno) which runs on an algorithm and motion sensors. The basis of this spoon is to sense the person's motion and smartly move opposite to that of the affected person's motion.

WEED REMOVAL MACHINE FROM THE PADDY FIELD



Prince Kumar, a student of class Xth of Nagar Palika Inter College, Ahroura, Mirzapur, Uttar Pradesh, has proposed a machine which can remove weed from the paddy fields. The designed machine comprises of a wheel, sharp blades on each of the surfaces of the wheels and a handle which can be arranged in a way that can move back and forth easily thereby removing the weeds. An idea like this is of immense importance in a nation, where more than 50% of the population is solely dependent on agricultural sector.

Fourth prize:- ₹ 20,000/-each
NO. OF PRIZES :- FOUR

NERO-NETTOYER

नीरो -नेटटॉयर:- जल स्वच्छ करने वाला यंत्र



Syed Tahir Ali, S. Aadesh and M.K. Apinayan, students of class IX of Mount Litera Zee School, Trichy, have come up with an idea to clean water bodies by designing a

customized boat which will contribute in its own way to save the planet earth. This is basically a small boat which can remove the floating debris out of water. The entire boat is controlled

by a micro-controller which has been coded in the C-language. This boat mainly comprises of a base, conveyor belt and oil absorbing mechanism (equipped with activated carbon) to clear oil-spillage. This trash inceptor consumes less time and is also economically beneficial.

NERO-NETTOYER can also be implemented in many governmental schemes like "Ganga Action Plan, "Namami Devi Narmade" and "National River Conservation Plan".

LIFE SAVING HELMET



A.J Surya, Venuram R.R and S.venkateswaran, students of class XIIth of Vidya Mandir Senior Secondary School, Mylapore, Chennai have designed a modern Life Saving helmet.

This helmet helps in detection of various types of head injuries affecting various regions of the brain. The detection is done with the help of impact sensors & proximity sensors which is connected to the nearby ambulance. The impact sensor measures the level of impact (pressure) & gives output on the displayed screen based on the intensity of the injury via colour coded signals. The proximity sensor which is lining inside of the helmet indicates the deformity in the skull.

LOW COAST SMART PRECISION AGRICULTURE TECHNOLOGY FOR FARMERS AND GARDENERS



M. Hemasri, a student of class VIIIth of Bannari Amman Public School, Alathukombai, Erode, Tamil Nadu, has developed a solution for precise crop cultivation using a smart technology. This device is a compilation of soil moisture sensor, temperature & humidity sensor, rain sensor, LDR sensor, fire sensor, GSM module, buzzer, fog-sprayer and AC water pump. The circuit is designed to work automatically and hence, there is no need for any human intervention. This tool will lead to increased productivity,

reduced input costs and input usage reduction thereby improving the farm profitability.

बन्नारी अम्मन पब्लिक स्कूल, अलतूकोम्बाई, इरोड, तमिलनाडु के आठवीं कक्षा की छात्रा एम. हेमाश्री ने एक स्मार्ट तकनीक का उपयोग करके सटीक कृषि के लिए एक नयी विधि विकसित की है। छात्रा एम. हेमाश्री ने एक उपकरण बनाया है जो की मिट्टी नमी संवेदक, तापमान और आर्द्रता सेंसर, रेन सेंसर, LDR सेंसर, फायर सेंसर, जीएसएम मॉड्यूल, बजर, फॉग-स्प्रयर और एसी वाटर पंप का संकलन है। यह

उपकरण स्वचालित है और किसी भी मानवीय हस्तक्षेप की इसमें आवश्यकता नहीं है। इस उपकरण से मिट्टी की उत्पादकता, नमी की मात्रा और मिट्टी का तापमान आदि का पता लगाया जा सकता है। यह उपकरण किसानों के लिए बहुत ही लाभप्रद है और इससे उनको खेत की उत्पादक क्षमता बढ़ाने में मदद मिलेगी।

MINI ROTAVATOR



Arjun Sonkar, a student of class Xth of Nagar Palika Inter College, Ahroua, Mirzapur, Uttar Pradesh, has proposed a low-cost mini rotavator machine which helps in tilling and pulverizing the soil. This rotavator is suitable for light and medium soil conditions. It is also applicable in dry or wetland for primary as well as secondary cultivation. A tool being economical and time-saving and one which doesn't require much physical strength can be of a great aid to the average-income farmers.

Fifth Prize:- ₹ 10,000/-
NO. OF PRIZES :- one

MICROPA-METHOD FOR FILTERING MICROPLASTIC USING MICROALGAE



Aditya P.S. Chauhan and **Tejas Sharma**, students of class IXth of Bharatiya Vidya Bhavan's R.K. Sarda Vidya Mandir, Raipur, have designed a novel method of filtration of micro plastics present in tap water. The device comprises of a cartridge impregnated with microalgae species such as R.

Salina and C. Neogracle. The principle is based on a transitory motion of micro plastics in contaminated water through a layer of microalgae aggregates, which will allow them to form hetero aggregates thereby simplifying the purification process. This devised cartridge can be employed in the existing water purifiers as well. Hence, incorporating such a device will be of a great help in keeping the problems faced due to micro plastics at a bay.