

## CRTDH

CRTDH (Common Research & Technology Development Hub) is a project funded by DSIR, Govt. of India. CRTDH provide facilities for R&D and services enabling environmental interventions for MSMEs. Environmental issues associated with MSMEs are taken up for development. Data on pollutant emissions will be collected for rational design of pollution control systems. Technical support is provided to meet regulations as well as to reduce resource consumption and improve efficiency of operation. CRTDH facilities are available for use by entrepreneurs.

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सीएसआईआर-राष्ट्रीय अंतर्विषयी विज्ञान तथा प्रौद्योगिकी संस्थान  
सीएसआईआर-एनआईआईएसटी  
तिरुवनंतपुरम

CSIR-NATIONAL INSTITUTE  
FOR INTERDISCIPLINARY SCIENCE  
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CSIR-NIIST  
THIRUVANANTHAPURAM

## Environmental Technology



# CSIR-NIIST Environmental Technology

The Environmental Technology (ET) division develops innovative technologies for mitigating pollution hazards and degradation of environment and adding value to natural resources. We provide knowledge based services for environmental impact assessment and pollution monitoring and are the only NABET / QCI accredited Category A, EIA consultant organization in Kerala State.

The computational modeling group of CSIR-NIIST has proven expertise in computational methods for designing engineering processes and biological systems. As a truly interdisciplinary team of engineers, biologists, chemists, mathematicians and computer scientists, we make use of our interdisciplinary expertise to solve real problems on the ground. Some of the areas of research and technology development are:

- Municipal and household waste treatment
- Industrial effluent treatment
- Odour Control
- Biodrying process for MSW
- Clean bioprocesses for natural fibre extraction
- Clean bioprocesses for white pepper production
- Environmental impact assessment
- Marine ecological Studies
- Biofuel from marine microalgae
- Assessment and bioremediation of perchlorate
- Environmental monitoring of Dioxins and POPs
- Water, soil, sediment & biological quality analysis
- Climate change & related issues
- Model based process design for scaling up of reactors
- CFD applications in process engineering
- Solidification simulation for metal casting process
- Computational Biology

## ENVIRONMENTAL TECHNOLOGY

The Environmental Technology Division develops innovative technologies and provides engineering solutions and consultancy services for environmental management. This Division has a state-of-art laboratory and pilot plant facilities for the development of pollution control systems.

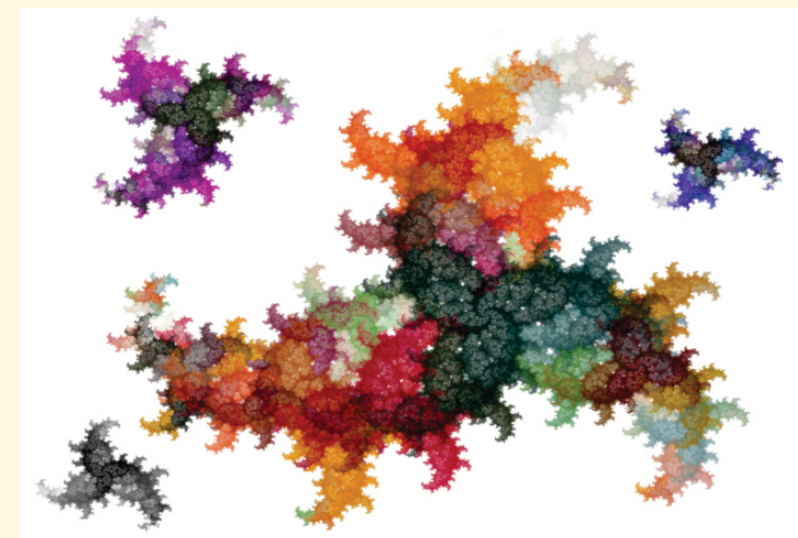
Technologies available are:

- Industrial Odour control
- BFBR – a new generation UASB
- Bioprocess for white pepper production
- Clean bioprocess for natural fibre extraction
- Compact kitchen waste digester cum biogas plant
- Decentralized sewage treatment system
- Assessment & remediation of perchlorate
- Environmental Impact Assessment

CSIR-NIIST is the only organization accredited under NABET / MoEF for EIA studies of mining and ports / harbor in South India.

## COMPUTATIONAL MODELING AND SIMULATION

The Computational Modeling and Simulation Group develops physics based computational models for a wide range of phenomena and processes like metal casting, chemical reactors and complex biological systems. We have developed and successfully commercialized simulation software for the small and medium scale foundries in India. Significant contributions have been made in the area of synthetic rutile technology, in terms of developing model based design for scaling up of reactors. The group has expertise in hard core computing techniques like development of numerical solution of partial differential equations using FDM, FVM techniques complemented by soft computing paradigms- Agent Based Modeling, Genetic Algorithms, Data Analytics. We undertake technical software development projects for government and industry clients.



## Ongoing Research

- CFD based design tools for mixing & heat transfer phenomena in chemical reactors using ANSYS-CFX.
- Additional modules for the commercial metal casting software product, AutoCAST FLOW<sup>+</sup>: Blowhole prediction module, Investment casting process module.
- Simulation of squeeze casting and centrifugal casting process using FLOW3D.
- Network Modelling for Integrative Biology – ErbB and Wnt signal transduction pathways.
- Bioinformatics@CSIR for societal benefits – GIS-linked spatial modelling of outbreak and spread of vector-borne diseases.
- Multi Institutional project on Smart Manufacturing, SMART 2020, a forerunner to Industrie 4.0 – demonstration of Smart Foundry for the metal casting industry.

## ANALYTICAL SERVICES

- Analysis of all types of water/wastewater samples from ground water to industrial effluents
- Monitoring DIOXIN levels
- Monitoring contaminants like perchlorate in water resources
- Beneficiaries include industries, hospitals, policy makers like Govt. Departments & Ministries, regulatory agencies like pollution control boards, hotels, resorts, healthcare units etc.