

Theme of Workshop

Ambient energy harvesting systems became very famous in modern technology for powering low energy demanding devices like wireless sensor nodes, electronic circuits and LEDs. Several ambient energy sources like wind, vibration, noise, heat can be exploited conveniently and converted into electric power using suitable mechanisms. The technology of energy harvesting is now well matured and still several developments are noticed in this field. This workshop focuses on the various developments in the field of vibration based energy harvesting systems. Both mechanical and electrical circuit technologies will be described in detail. The systematically organized content of the workshop also provides few expert lectures along with some laboratory sessions. Scope of the various engineering disciplines like optimization and machine learning techniques in the energy harvesting procedures will be explored in a clear manner. Several application studies will also be explained in presentations.

Topics to be covered

There will be introductory lectures, invited talks and laboratory session with Multiphysics solver during these days. The following are the list of topics to be covered in this course:

- Different types of ambient energy harvesting systems.
- Vibration energy harvesting for condition monitoring sensors.
- Types of natural excitations for harvesting.
- Output power augmentation techniques with nonlinearity and hybrid harvesters
- Optimization design in harvester modeling
- Metamaterials and auxetic structures in harvester designs.
- Combined control and harvester design
- Stochastic resonance and bistable systems
- Experimental methodology in lab harvesters.

About the Institute

National Institute of Technology Rourkela is an Institute of national importance created under the act of parliament. NIT Rourkela has been ranked as 225 and 31th position in QS Asia University and QS Indian University Ranking 2021, respectively. It has also been ranked in 121st position in QS BRICS category, 2020. Times Higher Education has figured NIT Rourkela in the group of 801-1000 in World University Ranking 2022. The institute provides quality education in a diverse and multicultural environment. The mission of the institute is to become an internationally acclaimed institution of higher learning that will serve as a source of knowledge and expertise for the society and be a preferred destination for undergraduate and post graduate studies. The institute is offering undergraduate, post graduate and PhD programs in 21 branches of Engineering. The departments are engaged in consultancy and research activities of several government bodies such as DST, DAE, CSIR, DRDO, BARC, ISRO and private industries. The campus has green and beautiful gardens.

About the Department

The Mechanical Engineering Department is well known for teaching and research activities. The main research works are on the Industrial vibrations and condition monitoring, robotics, CAD/CAM, precision engineering, Metal forming, manufacturing, CFD, Industrial refrigeration and Cryogenics. Both core and interdisciplinary topics are included in curriculum. The department at present has over two hundred research scholars pursuing projects on diverse fields. The faculty specializations are organized under three divisions: Machine design and analysis, Production Engineering and Thermal Engineering. There are four PG specializations including industrial cryogenics. The department has well equipped laboratories for both PG classes and research works. Department has at present 31 faculty members and around 100 PG students in all four specializations. The department organizes several short term courses, conferences as well as student level programs through-out the year. It has dedicated computer center with licensed software and a workshop for fabrication works.

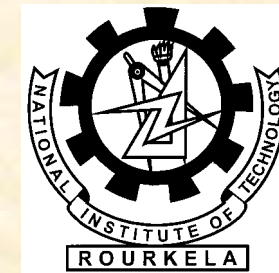


National Workshop

on

Modern Perspectives in Sustainable Ambient Energy Harvesting

(20th -24th June 2022)



Organized by:
Machine Design Division
Department of Mechanical Engineering,
NIT, Rourkela
Website: www.nitrkl.ac.in