

# Introduction to Metal Foams and Cellular Metals

## Overview

Metal foams and other cellular metals are increasingly finding favour in the scientific community due to their novel physical, mechanical, thermal, electrical and acoustic properties. The high specific strength or stiffness (i.e., strength/stiffness to weight ratio) in conjunction with functional properties makes them potential materials for light-weight construction, energy absorption and thermal management.

During this course the classification of metal foams and other cellular metals will be discussed. An overview of all the presently existing processing techniques will be given, including some of the most recently developed processing techniques.

After this, there will be a lab module where the participants will have hands-on experience on how metal foams are produced. Two processing techniques will be demonstrated in the lab.

The further course will then teach the main characterization techniques and tools used to evaluate the structural, mechanical, acoustic, and other properties of these materials. Particular emphasis will be put on advanced characterization techniques such as X-ray tomography and radiography. Properties and related applications will be presented in the final lectures.

<b>Dates for the Course</b>	<b>5<sup>th</sup> December, 2016 to 11<sup>th</sup> December, 2016</b>
<b>Host Institute</b>	<b>IIT Madras</b>
<b>No. of Credits</b>	<b>1</b>
<b>Maximum No. of Participants</b>	<b>30</b>
<b>You Should Attend If...</b>	<ul style="list-style-type: none"> <li>▪ You are a student or faculty from academic institution in the area of material science, metallurgy, ceramics, chemical engineering, engineering design, applied mechanics, mechanical engineering and interested in porous structural and functional materials.</li> <li>▪ You are a student or faculty from academic institution interested in light-weight structural materials and materials for crash protection.</li> <li>▪ You are a research scientist from construction and automotive industry.</li> </ul>
<b>Course Registration Fees</b>	<p>The participation fees for taking the course is as follows:  <b>Student Participants:</b> Rs.1000  <b>Faculty Participants:</b> Rs.3000  <b>Government Research Organization Participants:</b> Rs.3000  <b>Industry Participants:</b> Rs.5000</p> <p>The above fee is towards participation in the course, the course material, computer use for tutorials and assignments, and laboratory equipment usage charges.</p> <p><b>Mode of payment: Demand draft in favour of “Registrar, IIT Madras” payable at Chennai</b>  The demand draft is to be sent to the Course Coordinator at the address given below.</p>
<b>Accommodation</b>	<p>The participants may be provided with hostel accommodation, depending on the availability, on payment basis. Request for hostel accommodation may be submitted through the link:  <a href="http://hosteldine.iitm.ac.in/iitmhostel">http://hosteldine.iitm.ac.in/iitmhostel</a></p>

## Course Faculty



**Prof. John Banhart** is a professor at the Technical University of Berlin. His research interest includes light metallic materials and materials for energy conversion and storage as well as on the methods needed to explore their structure. He is associated with the area of metal foams for more than 20 years.



**Dr. Manas Mukherjee** is an assistant professor of Indian Institute of Technology, Madras. His research interests are processing and characterization of metal foams and physics of foaming.

## Course Coordinator

**Name: Dr. Manas Mukherjee**

Phone: 044-2257-4782

E-mail: [manas.mukherjee@iitm.ac.in](mailto:manas.mukherjee@iitm.ac.in)

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Dept. Metallurgical and Materials Engineering

IIT Madras

Chennai - 600036

URL:

<http://mme.iitm.ac.in/manas.mukherjee/>