

# Seminar

**Title:** Aircraft Failures (Material Problem and Life Time Assessment)

**Speaker:** Dr. Manfred Roth

Head of the laboratory for Joining and Interface Technology  
Swiss Federal Laboratories for Materials Science and Technology  
(EMPA)

**Time:** 10:00 -12:00(am) Sep. 13, 2011 (Tuesday)

**Place:** Meeting room 223, IPE Mansion

## Introduction

Dr. Manfred Roth was conferred his doctor degree from University of Erlangen, Germany in 1981 in the field of materials science. After that, he has worked in the ABB Research Center, Baden, Switzerland (focusing on the materials processing for steam turbine), Rensselaer Polytechnic Institute, Troy (N.Y.) (surface analysis). In 1985, he joined in the Empa as the head of the Laboratory Physical Metallurgy/Metallography and later the Laboratory Joining- and Interface Technology. He is active in both publications and invited presentations.

## Outline of his talk

- Overview of Empa activities
- Joining and Interface Technology – Research and Industrial Application
- Aircraft Failures

The Joining and Interface Technology Laboratory plays a leading role in the following areas: basic and applied research in physical metallurgy, interface-technology, brazing/soldering, and specific welding/coating technologies. An important goal is modelling and characterisation of joints of dissimilar materials and of interface reactions. This includes detailed phase diagrams of different systems and technological properties like residual stresses, thermo-mechanical behaviour and microstructure. The concept of particle-reinforced alloys is investigated and applied in metal-ceramic joints and lead-free solders. System technology comprises design, engineering and development of high efficiency processing techniques for the following applications: Components for steam turbines and turbo-compressors, carbon-nanotubes for field-emitters, abrasive tools, nanostructured filler metals for automotive industry, vacuum glazing, and space technology.