The Pan-African School of Materials (PASMAT) will introduce selected African postgraduate students to phase diagrams and advanced concepts in the fatigue and fracture of materials. The two-week school will be held at the African University of Science and Technology in Abuja (AUST-Abuja). The first week will focus on fatigue and fracture. This will be taught by Prof. Wole Soboyejo (Princeton and AUST). The second week will present basic materials concepts required for the calculation of phase diagrams, as well as examples of the applications of phase diagrams in materials science and engineering. This will be taught by Prof. Lesley Cornish (Witwatersrand and AMSEN). The courses are open to postgraduate students who are currently engaged in materials-related masters and doctorate programs in science and engineering.

Interested students should send a CV and a one-page description of their thesis research to Ms. Tracey Odigie at tracey@aust.edu.ng by August 22, 2011.

**Tentative Program**

**Monday 5 September**
Afternoon/evening  Arrival in Abuja

**Tuesday 6 September**
Morning  Welcome breakfast
Morning  *Introduction to Mechanical Properties*
Afternoon  *Mechanisms of Fracture*

**Wednesday 7 September**
Morning  *Fundamentals of Linear Elastic Fracture Mechanics*
Afternoon  *Fundamentals of Elastic-Plastic Fracture Mechanics*

**Thursday 8 September**
Morning  *Toughening Mechanisms*
Afternoon  *Introduction to Fatigue*

**Friday 9 September**
Morning  *Fracture Mechanics and Fatigue*
Afternoon  *Environmentally-Assisted Fatigue*

**Saturday 10 September**
Morning  *Creep and Creep-Fatigue Interactions*
Afternoon  *Failure Analysis and Practical Scanning Electron Microscopy Session at SHESTCO*
Sunday 11 September
Morning Overview of course
tbd Optional campus and Abuja tours

Monday 12 September
Morning Introduction to Phases, and Applications of Phase Diagrams
Afternoon Simple Binary Phase Diagrams

Tuesday 13 September
Morning Introduction to the Interpretation of Microstructures
Afternoon Relating Microstructures to Phase Diagrams

Wednesday 14 September
Morning More Complex Binary Phase Diagrams
Afternoon Application of Binary Phase Diagrams to the Real World

Thursday 15 September
Morning Introduction to Ternary and Higher Order Phase Diagrams
Afternoon Examples of Ternary and Higher Order Phase Diagrams

Friday 16 September
Morning Applications of Ternary and Higher Order Phase Diagrams
Afternoon Interpretation of Higher Order Microstructures

Saturday 17 September
Morning Overview of course
Afternoon Closing reception and departure from Abuja

Instructors
Week 1 (6-11 September)
**Wole Soboyejo**
Vice President - Academic, Research and Innovation, and Professor, Department of Materials Science and Engineering, AUST-Abuja
Professor of Mechanical and Aerospace Engineering and the Princeton Institute for the Science and Technology of Materials (PRISM), Princeton University

Week 2 (12-17 September)
**Lesley Cornish**
Director, DST/NRF Centre of Excellence in Strong Materials, and Professor, School of Chemical and Metallurgical Engineering, University of the Witwatersrand
Director, African Materials Science and Engineering Network (RISE-AMSEN)