2014 EU-US Frontiers of Engineering Symposium

Atoms to Airplanes:
Designer/Engineered Aerospace Materials

Session co-chairs:
Dr. Weidong Song, The Boeing Company
Prof. Brian G. Falzon, Queen’s University, Belfast
Making airplanes: then (1903) and now (2008)
Air travel 2050

• EU Flightpath 2050 targets (wrt 2000 baseline):
  
  • 75% reduction in CO₂ emissions
  • 90% reduction in NOₓ emissions

*Weight reduction will continue to play a key role ...*

• 50% reduction in the cost of certification
• significant reduction in development costs

*Requirement for simulation and modelling at all stages of the development cycle ...*

Source: Flightpath 2050: Europe’s Vision for Aviation, EU, 2011

“The tyranny of scales” Oden et al. (2006)

Links between damage across scales is not well established!
Speakers

- **Prof. Ian Kinloch, University of Manchester**
  - Harnessing the unique and tremendous properties of nano-scale graphene structures to develop multifunctional composite structures.

- **Dr. Tobias Schaedler, HRL Labs**
  - Use of cellular architectures across scales leading to the development of a new class of lightweight materials with unprecedented structural properties.

- **Prof. Stephane Bordas, University of Luxembourg/Cardiff University**
  - Recent progress and challenges in the modeling of fracture of composite materials across scales.

- **William Grosse, The Boeing Company**
  - The emergence of an integrated multiscale modeling methodology for aircraft leading to highly novel and efficient design configurations.
Format

• 10:05 – 10:35 Prof. Ian Kinloch
  10:35– 10:40 (Q & A – clarification questions only)

• 10:40 – 11:10 Dr. Tobias Schaedler
  11:10 – 11:15 (Q & A – clarification questions only)

• 11:15 – 11:45 Prof. Stephane Bordas
  11:45 – 11:50 (Q & A – clarification questions only)

11:50 – 12.50 Lunch

• 12:50 – 13:20 William Grosse, The Boeing Company
  13:20 – 13:25 (Q & A – clarification questions only)

• 13:25 – 14:00 PANEL DISCUSSION