

## *Lightweight composite structures*

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**Salle de cours du LVA**- INSA de Lyon  
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*Adriaan Beukers is a full-time professor on Composite Materials and Structures at the Faculty of Aerospace Engineering at the Delft University of Technology, a part-time professor for Engineering with Composites at the Materials Department of the Catholic Leuven University. He is also former director of research and development strategies at the Centre for Lightweight Structures. This centre was collaboration between the university and the national institute for applied research (TNO) and since 2005 privatized. Since 1976 he has worked on the design, analysis and 'materialization' of novel composite structures for the university and industry with clients including Airbus, Bombardier, Boeing and Extra. In 2003 he received and accepted the invitation to become Visiting Fellow of the Composites Centre of the Doshisha University in Kyoto, Japan. The Fellowship comes with an invitation to do research on topics concerning sustainable composites as a durable means for lightweight structures. For the great number of patented innovations (>50) and utilizations (>25 spin off's and techno starter companies) in the field of novel composite materials, lightweight structures and manufacturing processes of his group, he was awarded in 2006 by the national board of universities (VSNU/Science Alliance) to be 'The most Entrepreneurial Scientist of the Netherlands'. For his scientific work, lecturing and valorisation the board of directors of the Delft University awarded him in 2008 to be the best University Professor.*

*Adriaan's approach to materials and structures development highlights the importance of using minimum material and energy to achieve the optimum physical and mechanical properties possible of a structure, without neglect of functional requirements. An active application of both function integration and segregation as a design philosophy was leading to unusual and successful composite designs ranging from ultra lightweight rescue bags, beer kegs and pressure vessels to aircraft fuselages. As a co-author of the book 'Lightness' (1998) and 'Flying Lightness' (2005), he advocates the study of nature's organic structures as an inspiration for development of man-made polymeric materials, which can be shaped, reinforced and pre-tensioned. These result in mechanically stable structures, which can incorporate a number of high performance characteristics, such as maximum strength per unit weight and thermal and acoustic damping properties.*