



Dr Giuliano Allegri
MSc, PhD

Reader in Composite Structures

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Summary

Giuliano's research addresses four main themes: 1) the characterisation and numerical modelling of fracture and fatigue in fibre-reinforced composites, with particular emphasis on suppressing delamination via through-thickness reinforcement; 2) understanding and predicting the effect of the space environment on polymer-based materials; 3) the development of modelling tools based on probabilistic structural mechanics, such as the stochastic finite element method; 4) the aero-servo-elastic design of morphing aircraft structures.

Biography

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Giuliano holds a master degree in Aeronautical Engineering "cum laude" and a PhD in Aerospace Engineering, both awarded by the University of Rome "La Sapienza". Since 2007, Giuliano has held lectureship posts at Cranfield University, the University of Bristol and Imperial College London, where he also acted as Director of Undergraduate Studies for the Aeronautics MEng programme. Giuliano has supervised 10 PhD students through to completion and as acted as external examiner both in the UK and overseas. He has authored 50 journal papers, several books chapters and more than 80 conference contributions.

Keywords

- composite materials/structures
- probabilistic aspects of material fatigue
- aeroelastic design

Expertise

My research is focused on the prediction of damage onset and propagation in light alloys and composite materials/structures, with special emphasis on material fatigue. I have also expertise in the design of space structures and the mitigation of spacecraft interactions with the Earth orbital environment.

- prediction of damage onset
- light alloys
- composite materials
- material fatigue
- aeroelastics

Memberships

Organisations

[Department of Aerospace Engineering](#)

Other sites

- [Engineering](#)

Recent publications

- Warzok, F, Allegri, G, Gude, M & Hallett, SR, 2019, '[Experimental study of Z-pin fatigue: understanding of mode I and II coupon behaviour](#)'. *Composites Part A: Applied Science and Manufacturing*, vol 127.
- Melro, A, Serra, J, Allegri, G & Hallett, SR, 2019, '[A SMEARED COHESIVE LAW FOR MODELLING Z-PINNED COMPOSITE LAMINATES' DELAMINATION](#)'. in: *7th ECCOMAS Thematic Conference on the Mechanical Response of Composites Proceedings*.
- Melro, A, Serra, J, Allegri, G & Hallett, SR, 2019, '[AN ENERGY-EQUIVALENT COHESIVE LAW FOR MODELLING Z-PINNED COMPOSITE LAMINATES](#)'. in: *ICCM22 Proceedings*.
- Melro, A, Serra, J, Allegri, G & Hallett, SR, 2019, '[An energy-equivalent bridging map formulation for modelling delamination in through-thickness reinforced composite laminates](#)'. *International Journal of Solids and Structures*.
- Manno, R, Allegri, G, Melro, A, Hallett, SR & Reis, F, 2019, '[MICRO-SCALE ANALYSIS OF PROGRESSIVE DAMAGE IN CERAMIC MATRIX COMPOSITES](#)'. in: *ICCM22 Proceedings*.
- Serra, J, Melro, A, Allegri, G & Hallett, SR, 2019, '[THROUGH-THICKNESS ENHANCEMENT OF A COMPOSITE LAMINATE WITH VARIABLE THICKNESS](#)'. in: *ICCM22 Proceedings*.
- Cui, H, Mahadik, Y, Hallett, SR, Partridge, IK, Allegri, G, Ponnusamic, SA & Petrinic, N, 2019, '[Coupon scale Z-pinned IM7/8552 delamination tests under dynamic loading](#)'. *Composites Part A: Applied Science and Manufacturing*, vol 125.
- Allegri, G, 2018, '[Modelling fatigue delamination growth in fibre-reinforced composites: Power-law equations or artificial neural networks?](#)'. *Materials and Design*, vol 155., pp. 59-70
- Cui, H, Yasaee, M, Hallett, SR, Partridge, IK, Allegri, G & Petrinic, N, 2018, '[Dynamic bridging mechanisms of through-thickness reinforced composite laminates in mixed mode delamination](#)'. *Composites Part A: Applied Science and Manufacturing*, vol 106., pp. 24-33
- Mohamed, G, Allegri, G, Yasaee, M & Hallett, SR, 2018, '[Cohesive element formulation for z-pin delamination bridging in fibre reinforced laminates](#)'. *International Journal of Solids and Structures*, vol 132-133., pp. 232-244

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