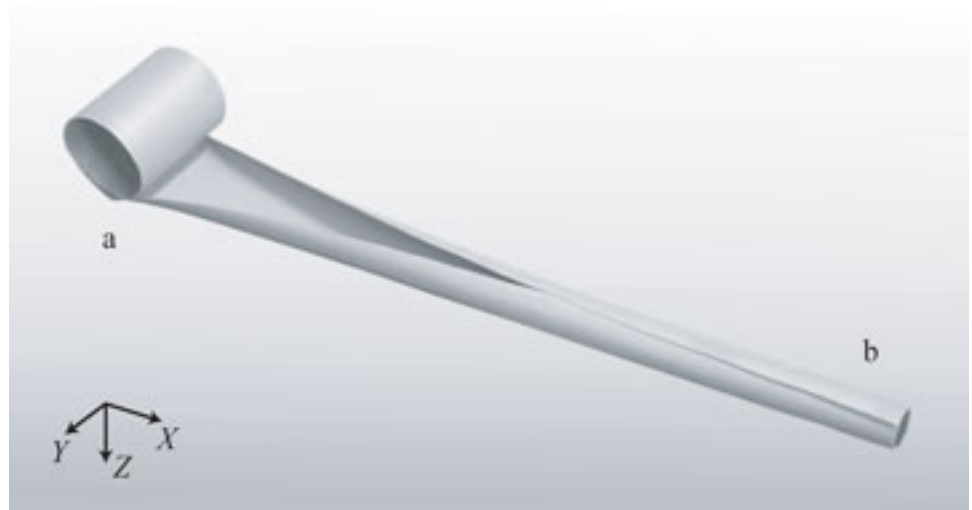




**Professor Simon D. Guest**



Bistable tubes are split tubes with essentially the same geometry as a carpenter's tape; however, unlike a carpenter's tape, which is only stable when extended (b), these structures have a second stable state, they are also stable when coiled (a).

See:

<http://www3.eng.cam.ac.uk/~sdg/>

<https://www-structures.eng.cam.ac.uk/directory/sdg13@cam.ac.uk>

[https://www.researchgate.net/scientific-contributions/72925807\\_Simon\\_D\\_Guest](https://www.researchgate.net/scientific-contributions/72925807_Simon_D_Guest)

[http://www.cirs.info/chercheurs-fiche\\_langue.eng-id.467.html](http://www.cirs.info/chercheurs-fiche_langue.eng-id.467.html)

[https://scholar.google.co.uk/citations?user=vEwr\\_JMAAAAJ&hl=en](https://scholar.google.co.uk/citations?user=vEwr_JMAAAAJ&hl=en)

Structural Mechanics, Department of Engineering  
University of Cambridge, UK

### **Brief Biography:**

Simon Guest is Professor of Structural Mechanics, in the Structures Group of the Department of Engineering at the University of Cambridge. His teaching is in structural mechanics, and his research straddles the border between traditional structural mechanics, and the study of mechanisms. He is also a fellow of Trinity Hall. He is currently Head of Civil Engineering.

### **Research:**

My research straddles the border between traditional structural mechanics, and the study of mechanisms; this academic area turns out to encompass many interesting technologies and provide many exciting and challenging problems. Much of my work is with the Advanced Structures Group.

The following describe my work in a number of areas:

- **Morphing lattice structures:** Morphing structures can change their shape to respond to or alter their environment. Recently, there has been a great deal of interest in using lattice structures as the microstructure of a new class of morphing materials.
- **Biological structures:** Many biological systems can be both structures and mechanisms; I've looked at the cytoskeleton, the scaffolding of cells, some aspects of the shape of proteins, the structure of some viruses, and the use of biomimetics to generate novel structures.

- **Symmetry:** Structures and mechanisms that are symmetric often have interesting properties that depend on their symmetries.
- **Bistable structures:** I have looked at a particular class of bistable structure, split tubes with essentially the same geometry as a carpenter's tape. These tubes can be made bistable, either by altering the bending stiffnesses of the structure so that it is no longer isotropic, or by setting up an initial prestress in the structure.
- **Deployable Structures:** Deployable Structures are structures which can be reduced in size for transportation or storage, and then automatically deployed. Most commonly, these structures are used in space.

### Selected Publications:

- S. D. Guest and S. Pellegrino. "Inextensional Wrapping of Flat Membranes." In First International Conference on Structural Morphology, edited by R. Motro and T. Wester, pp. 203–215. Montpellier, 1992
- S.D. Guest, S. Pellegrino, The folding of triangulated cylinders, I: geometric considerations, ASME J. Appl. Mech. 61 (1994) 773–777.
- S.D. Guest, S. Pellegrino, The folding of triangulated cylinders, II: the folding process, ASME J. Appl. Mech. 61 (1994) 778–783.
- S.D. Guest, S. Pellegrino, The folding of triangulated cylinders, III: experiments, ASME J. Appl. Mech. 63 (1996) 77–83.
- Guest, S. , and Pellegrino, S. , 1996, " A New Concept for Solid Surface Deployable Antennas," Acta Astronaut., 38(2), pp. 103–113.
- IUTAM-IASS Symposium on Deployable Structures: Theory and Application, (Edited by S. Pellegrino and S. D. Guest), Kluwer Academic Publishers, 1998
- Kangwai, R.D., Guest, S.D. & Pellegrino, S. (1999). An introduction to the analysis of symmetric structures. Computers & Structures, 71, 671–688.
- S. Pellegrino, C. Green, S.D. Guest, and A.M. Watt. SAR Advanced Deployable Structure. Department of Engineering, University of Cambridge, CUED/D-STRUCT/TR191, 2000.
- De Focatiis D S A and Guest S D 2002 Deployable membranes designed from folding tree leaves Philosophical Transactions of the Royal Society of London. Series A: Mathematical, Physical and Engineering Sciences 360 227–38
- Guest, S. D., and Hutchinson, J. W., 2003, "On the Determinacy of Repetitive Structures," J. Mech. Phys. Solids, 51, pp. 383 – 391.
- Wicks, N., and Guest, S. D., 2003, "Single Member Actuation in Large Repetitive Truss Structures," Int. J. Solids Struct., 41, pp. 965 – 978
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- Galletly, D. A. & Guest, S. D. 2004 Bistable composite slit tubes I: a beam model. Int. J. Solids Struct. 41, 4517–4533
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- Kovács F, Tarnai T, Fowler PW, Guest SD (2004) A class of expandable polyhedral structures. Int J Solids Struct 41:1119–1137.
- Kovács F, Tarnai T, Guest SD, Gowler PW (2004) Double-link expandedhedra: A mechanical model for expansion of a virus. Proc R Soc London A Math Phys 460:3192–3202.
- Tibbalds, B. , Guest, S. , and Pellegrino, S. , 2004, " Inextensional Packaging of Thin Shell Slit Reflectors," Tech. Mech., 24(3–4), pp. 211–220
- Guest S D and Pellegrino S 2006 Analytical models for bistable cylindrical shells Proc. of the Royal Society A: Mathematical, Physical and Engineering Science 462 839–54

Guest, S.D. (2006). The stiffness of prestressed frameworks: A unifying approach. *International Journal of Solids and Structures*, 43, 842–854

Norman A, Guest S, Seffen K (2007) Novel multistable corrugated structures. *Collect Tech Pap AIAA/ASME/ASCE/AHS/ASC Struct Struct Dyn Mater Conf 6*:6379–6390

Gentilini, C., Seffen, K.A., Guest, S.D., Nobile, L., (2008). On the Behavior of Corrugated plates in Bending. *Procedia Engineering 1*: 79-82.

Norman, A.D., Golabchi, M.R., Seffen, K.A. & Guest, S.D. (2008). Multistable Textured Shell Structures, vol. 54 of *Advances in Science and Technology*, 168–173. SciencePress.com, Acireale, Sicily, Italy.

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