

Folding with Endless Potential: Origami as a Doorway to Innovation.

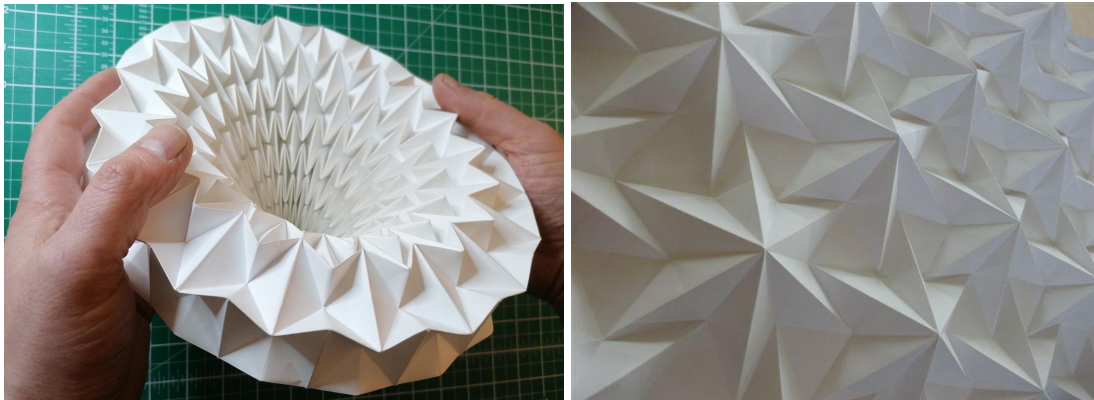
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Abstract:

Origami can be many things; for example, in this symposium we see the following:

- Infinite repeated folds by Tomoko Fuse.
- The meta-materials and robotics of Jiang Hanqing.
- Machine learning and applications of Lu Guoxing.
- The curved folding of Mitani Jun.
- Tunable meta-surfaces of Wang Yuesheng.
- The impact mitigating structures of Yang Jinkyu.
- Cogitative metamaterials of Chen Changqing.
- Deployable adaptive robots of Cho Kyujin.
- Reconfigurable origami tessellations by You Zhong.

As well as being many things origami is also a verb, an act of doing, and in this sense as a subject will never be finished or complete. Renowned origami artist Tomoko Fuse insightfully says that origami is not an act of creation, but of *discovery*. In a spirit of discovery, through our collective experience we propose it is no coincidence that origami is many things. Instead, we propose this structurally implicates origami as a transdisciplinary real-world meta-material whose multiplicity resonates with a deeper hidden order of reality that we can access through the act of folding.



(a)

(b)

Fig. 1: (a) Alex Pentek. Preparation for performance lecture 'Unfolding Realities', 2022, illustrating Michel Serres' idea of the vortex as a primal form that translates energy and information into itself before ultimately dissipating back into the field from which it arose. Image: Alex Pentek. Full video can be seen on <https://youtu.be/AfkLOLAd6ys>

(b) Alex Pentek. 'The Intimacy of Distance.' 2011. (Detail showing original star-fold pattern). Temporary paper installation folded from 10 x 1.5 m single sheet of acid free cartridge paper. Group exhibition Gravity, Crawford Gallery, Cork, Ireland. Curated by Peter Murray. Image: Alex Pentek.

In the following paper we hypothesise the fold as a process of becoming or *ontology*, through the writing of Levi Bryant [Bryant 16], David Bohm [Bohm 80], and Prof. Filipe de Salles [de Salles 21], where the endless pleated folds of origami are not only a metaphor for how things come into being, but are also an embodiment of wavelengths and holistic processes that store information and with which we can aesthetically resonate on many levels to create new innovative outcomes. We illustrate this by;

1. a selection of different artistic meanings of the fold and origami inspired artworks;
2. a method of artistic research called 'observationism' that allows us to see both on and beyond the surface of things, [Pentek 2023];
3. a series of collaborations and publications [Hao, Supple, O'Neil & Pentek, 2023], culminating with a Living Lab pilot project at University College Cork, 2023.

The Living Lab project explores the fold as a transdisciplinary, materials-led, innovative research tool across disciplines including Contemporary Art (A. Pentek), Robotics (G. Hao), Design Thinking, (B. Supple), Teaching and Learning, (N. Lorenzutti) and Microbiology. By these examples, we propose the fold as a doorway to innovation, and conclude with a methodology that allows access to the endless potential of the fold.

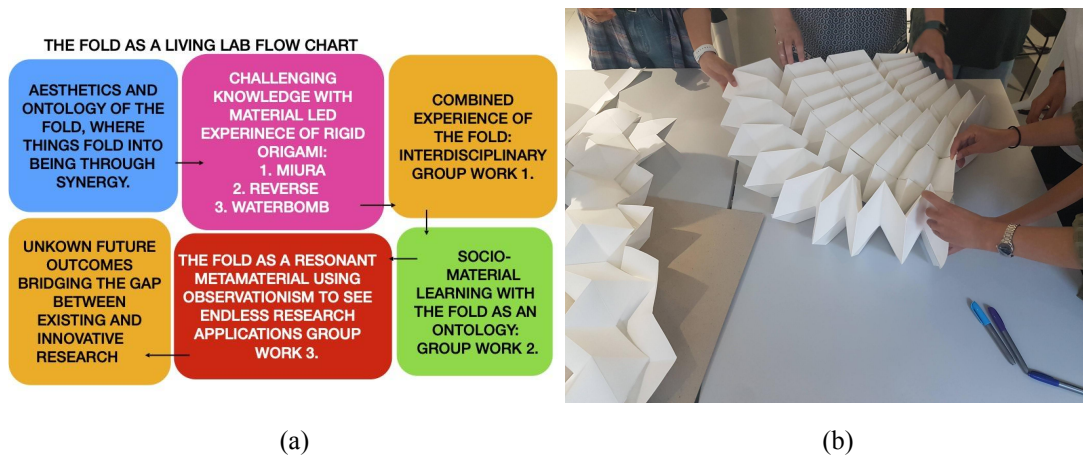


Fig. 2: (a) *The Fold as a Living Lab for innovative, material-led transdisciplinary research flow chart, illustrating the transition from intradisciplinary to interdisciplinary and transdisciplinary approaches, bridging the gap between existing and potential innovative research.*

(b) *The Fold as a Living Lab workshop image where participants learned origami techniques to innovate new research methodologies in their own various fields ranging from robotics, to design thinking, teaching and learning and microbiology. University College Cork, Ireland 2023.*

Key Words: Origami, contemporary art, folded ontology, resonance, transdisciplinary innovation, holistic processes, artistic research, Levi Bryant, David Bohm, Filipe de Salles

References

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