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## THE MODERN METROPOLIS

EXPLORE CHANDIGARH, WHERE ARCHITECTURE MEETS ART

FLIP THROUGH



Bleisure Chandigarh



Catalyst GST

Personality Vineet Bhatia



# AN UNFOLDING FUTURE

Origami revolution has been brewing in the world of engineering, science, architecture and design since the last sixty years and now with advanced computing, this architectural revolution is taking the world by storm

Words: Ankon Mitra

As children we have all made paper boats and floated them in puddles of collected rainwater or flown folded aeroplanes in class. This was the level of origami to which we were introduced in our childhood. While origami architecture is nothing like the boats, aeroplanes and windmills from our early years, it all starts from those humble paper toys and principles. From nano origami heart-stents that unclog blocked arteries when deployed into the blood stream to 100mt large solar panel arrays that can be packed into a 3mt diameter rocket and sent from the International Space Station and unfurled in space, Origami is everywhere today.

Manu Parekh, a Stanford bio-engineer, has invented a 50 cent paper-folded microscope that can fit in a pocket and be taken to remote rural locations where availability of a conventional microscope is difficult while testing for diseases.

So how is origami and architecture connected? In a seamless, connected, technology-driven world, principles of origami are being used to reshape spaces, modify doors and windows.

The idea is to do away with static and boxy buildings that we have come to accept as the mainstay of architecture. Origami architecture is dynamic, flexible, efficient, it can be light-weight, can transform spaces quickly and it does away with the traditional notion of cuboidal spaces.

From the folded architecture of leaves and flowers to the young 'fold' Himalayan mountains, folding technology and principles are everywhere.

## ORIGAMI ARCHITECTURE

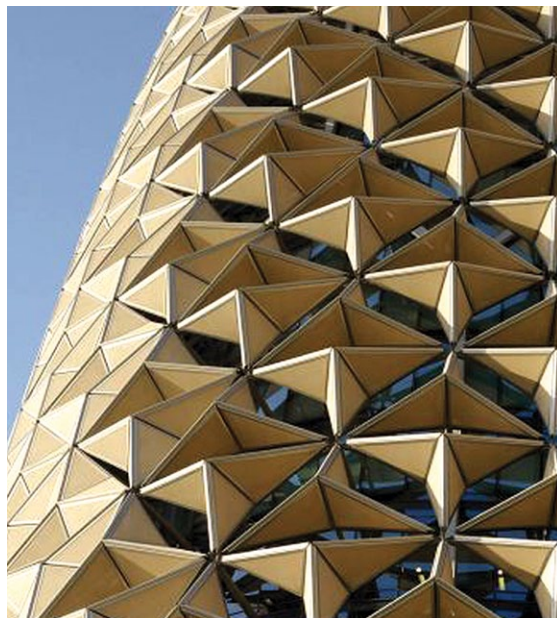
Origami, an ancient art of Japan, is a creative method of folding paper to develop beautiful shapes and forms. The development of origami architecture began with Professor Masahiro Chatani's (at the Tokyo Institute of Technology) experiments with designing original and unique greeting cards.



In Yum Yum Cha, a chain of Origami themed pan-Asian restaurants in Delhi NCR, they apply the bright colours of the Yum Yum Cha brand to the origami objects which populate these spaces, making them vibrant and positive.



The Helios House is a gas station in Los Angeles, which soon after its building in 2007 became a landmark of the city. Designed by Office dA in Boston and Johnston Marklee Architects in Los Angeles, it comes with special green origami features: the roof, which is draught tolerant and collects water from irrigation is formed of triangles made from recycled stainless steel and has cacti and 90 solar panels, which reduces the energy consumption of the station by 16 per cent.



## Origami architecture works to re-imagine and rework skyscrapers, bringing it more in-tune with sustainability principles

**Above:**  
The Al Bahr Towers and its dynamic origami inspired façade in Abu Dhabi

### DYNAMIC FACADES

What if facades could physically change and not only by the opening and closing of windows? It will allow different amounts of light at different times of the day, making us stop for a glance as they did not look the same yesterday or even two hours ago! This is now a reality. Combining origami with technology, in the Kiefer Technic Showroom, in Graz, Austria, architect Ernst Giselbrecht has created a grid of folded panels that constantly change and the facade never looks the same twice!

### HIGH-RISE BUILDINGS

We think of high-rise buildings as symbols of progress, as signifiers of wealth and prosperity. High-rises are energy guzzling monsters. They concentrate consumption to very high levels in a small footprint and such a high density of buildings create many challenges like the urban-heat island effect. Another worrying aspect is the unprecedented amount of energy

consumed by the air-conditioning of contemporary skyscrapers as they are clad largely with glass.

Since high-rise buildings are here to stay in our ever densifying cities with paucity of urban land, origami architecture works to re-imagine and rework these skyscrapers, bringing it more in-tune with sustainability principles. Inspired by the traditional *jaalis* (screens or fretwork panels) of middle-eastern architecture (which are called *Mashrabiya*s), AEDAS architects have created an Origami façade on the Al Bahr towers in Abu Dhabi, facing the hot south-west direction. The origami panels open and close, according to the time of the day. This is also a dynamic façade and apart from changing the look of the building, it also controls the amount of heat and light that is allowed to enter making the building more efficient climatically and minimising the use of artificial air-conditioning within.



**(Above)** Origami inspired facades at Studio Ardete in Panchkula, India; **(Left)** The Origami House in Pune; **(Bottom Left)** Arrays of Mechano-Electronic Origami Umbrellas in the Prophet's Mosque Courtyard in Medina, Saudi Arabia

Here origami transforms and refashions a traditional lattice screen and makes it an uber-cool technological marvel fit for a 21<sup>st</sup> century high-rise.

#### RETHINKING OPEN SPACES

During summer, in countries like India and the Middle East, we can only use open spaces if they are shaded. But in winter or in the evening, we may want to remove the shading. Origami comes to rescue once again. Re-imagining the traditional umbrella as a folding origami lattice mechanism, Bodo Rasch Architects have populated the entire courtyard of the Prophet's Mosque in Medina, Saudi Arabia with umbrellas that open in tandem during the day, bringing down the temperature of the courtyard from a sweltering 50 degrees celsius to a more bearable 39 degrees. The mosque fills with hundred-thousand pilgrims, especially during the hot Ramazan months and origami transforms the scorching courtyard into restful shaded

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## Architects have created an origami facade on the Al Bahr towers in Abu Dhabi

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space extending the usable interior spaces of the mosque.

#### ORIGAMI ARCHITECTURE IN INDIA

Closer to home, studios such as Hexagramm Design in Delhi are spearheading the origami design revolution in India with their initiative aptly called Oritecture. Hexagramm creates solutions for offices, homes, hotels and restaurant spaces, lending the articulation, geometry, vibrancy and differentiation of origami structures, furniture, lighting and architectural elements to these spaces.



#### AVIATION QUIZ

5. In which year did Qantas invent the Business Class?

Answers in the next issue of Vistara magazine.

Share your answers at [inflightmag@airvistara.com](mailto:inflightmag@airvistara.com). Five lucky winners will win prizes.