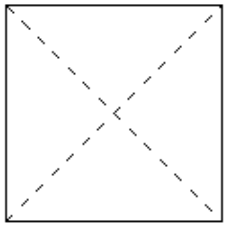
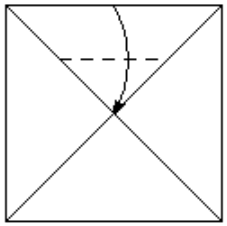
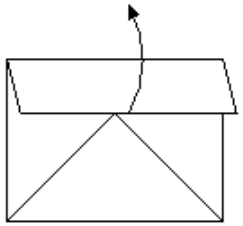


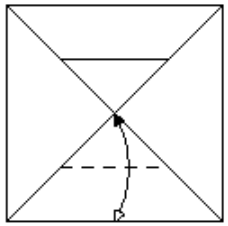
Crease the diagonals



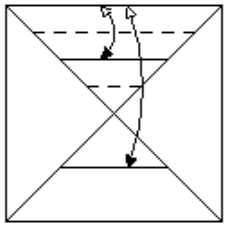
Fold the top edge to the center point, creasing only between the diagonals



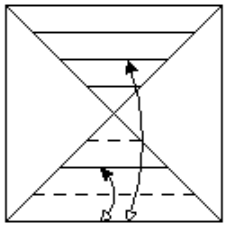
Unfold



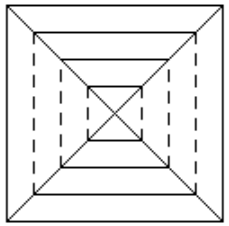
Repeat on the bottom (fold and unfold)



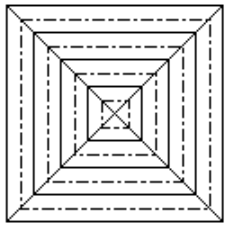
Fold and unfold on 1/4 and 3/4 marks



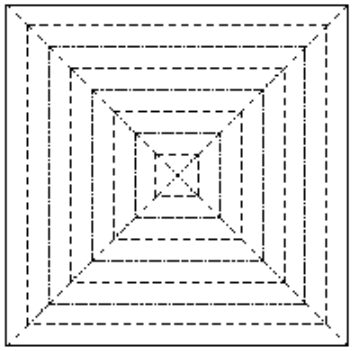
Repeat on the bottom



Repeat on left and right sides



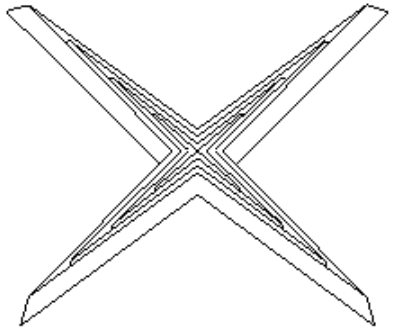
Turn over, and crease in between the squares in the opposite direction



Final crease pattern

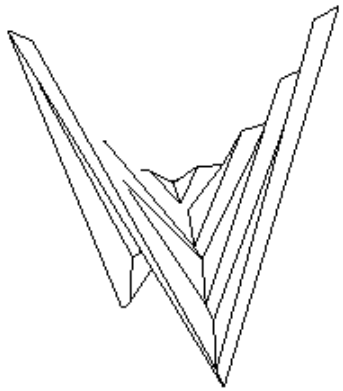
– – – Valley fold

–·–·– Mountain fold

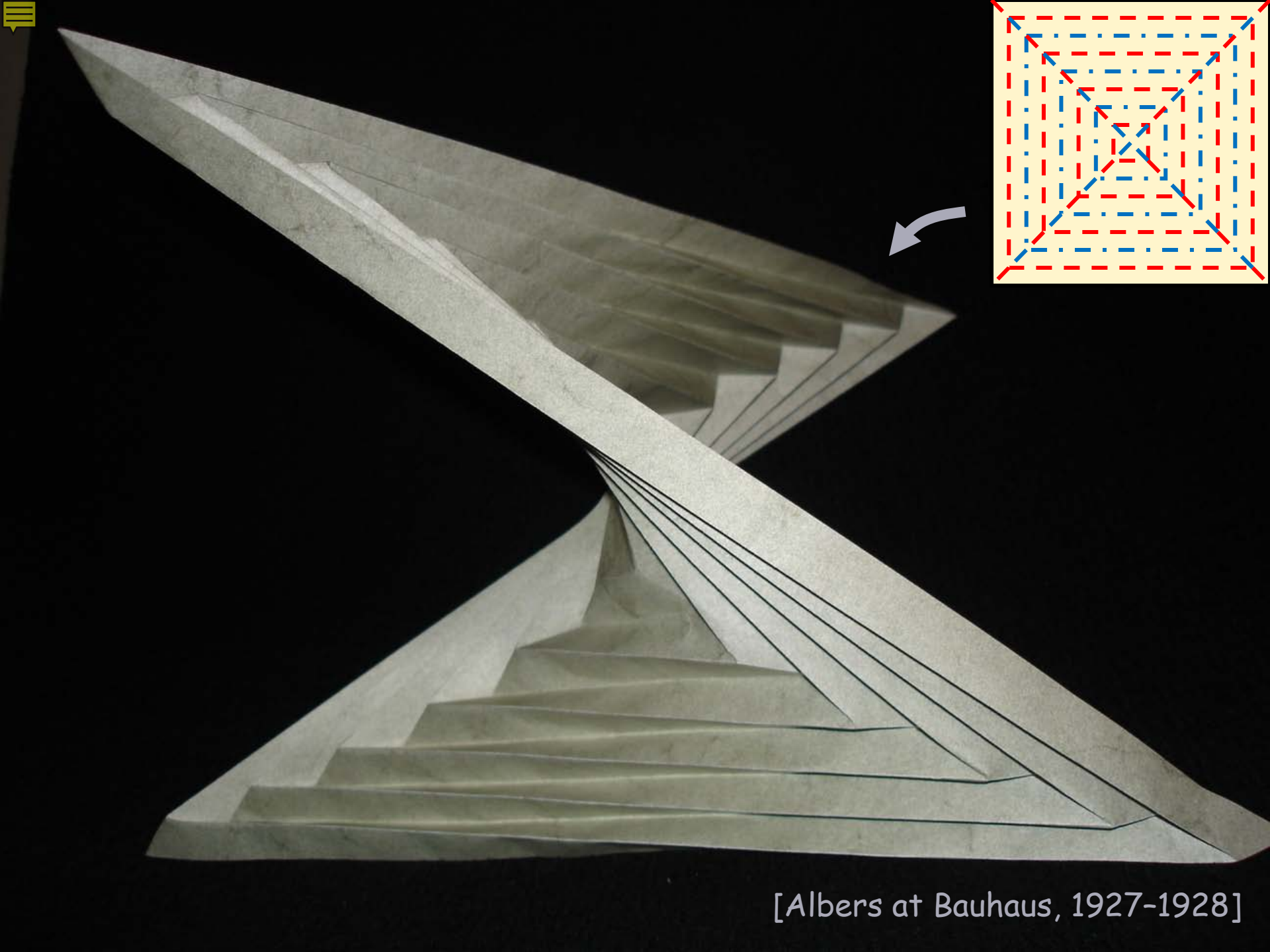


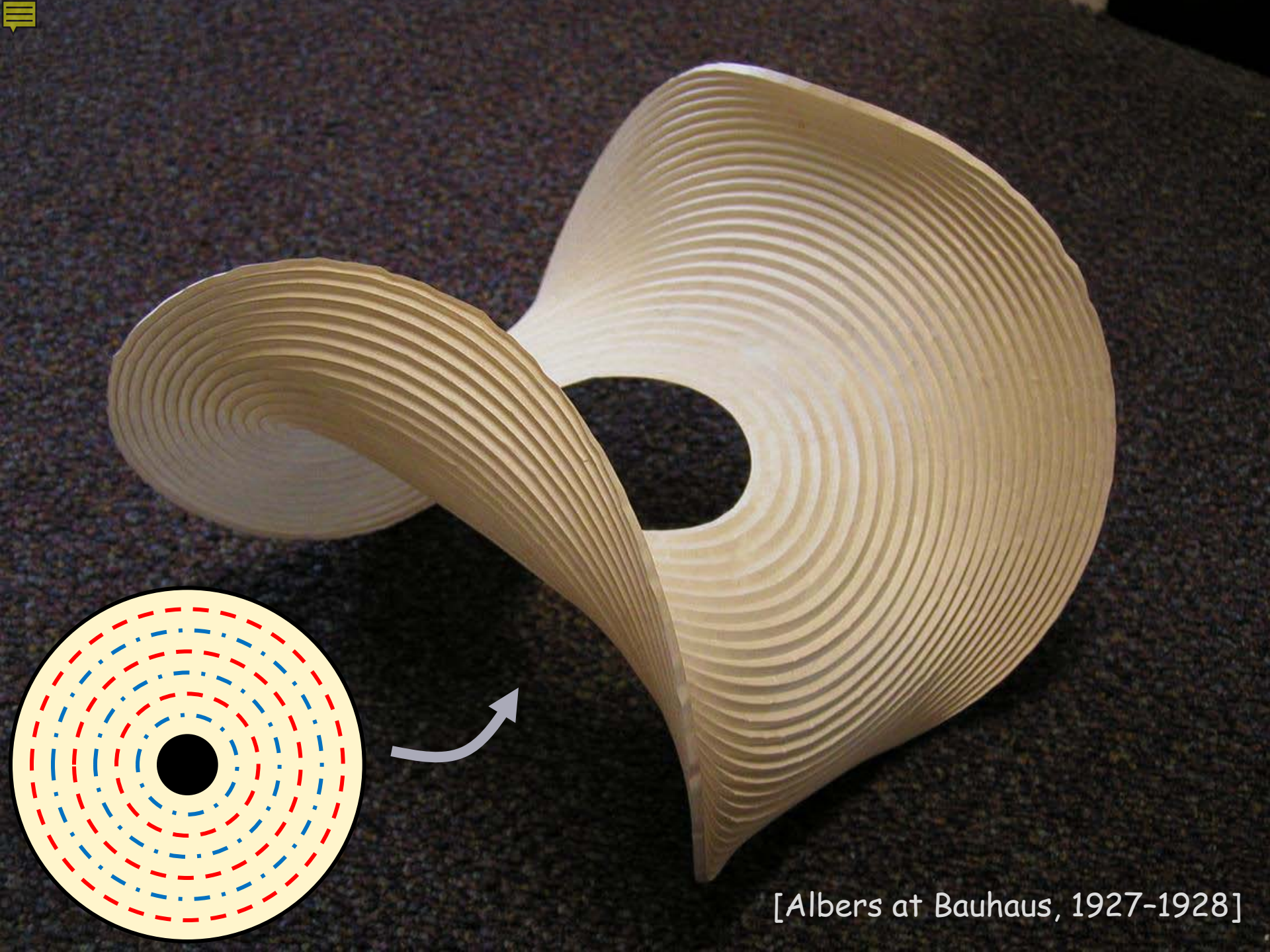
Folding the crease pattern completely forms an "X" shape

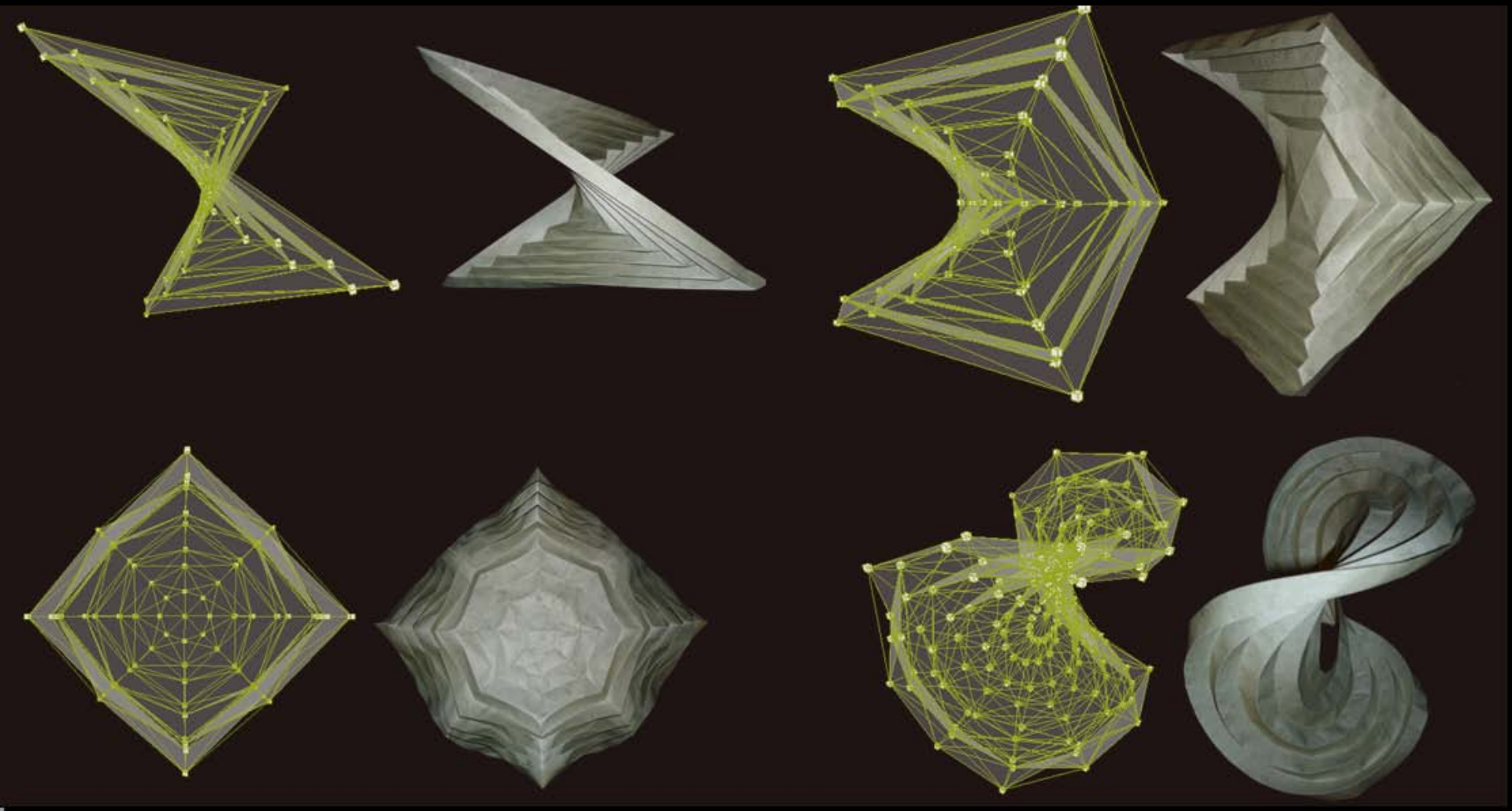
Partially opening it forms a hypar



Demaine, Demaine, Lubiw 1999

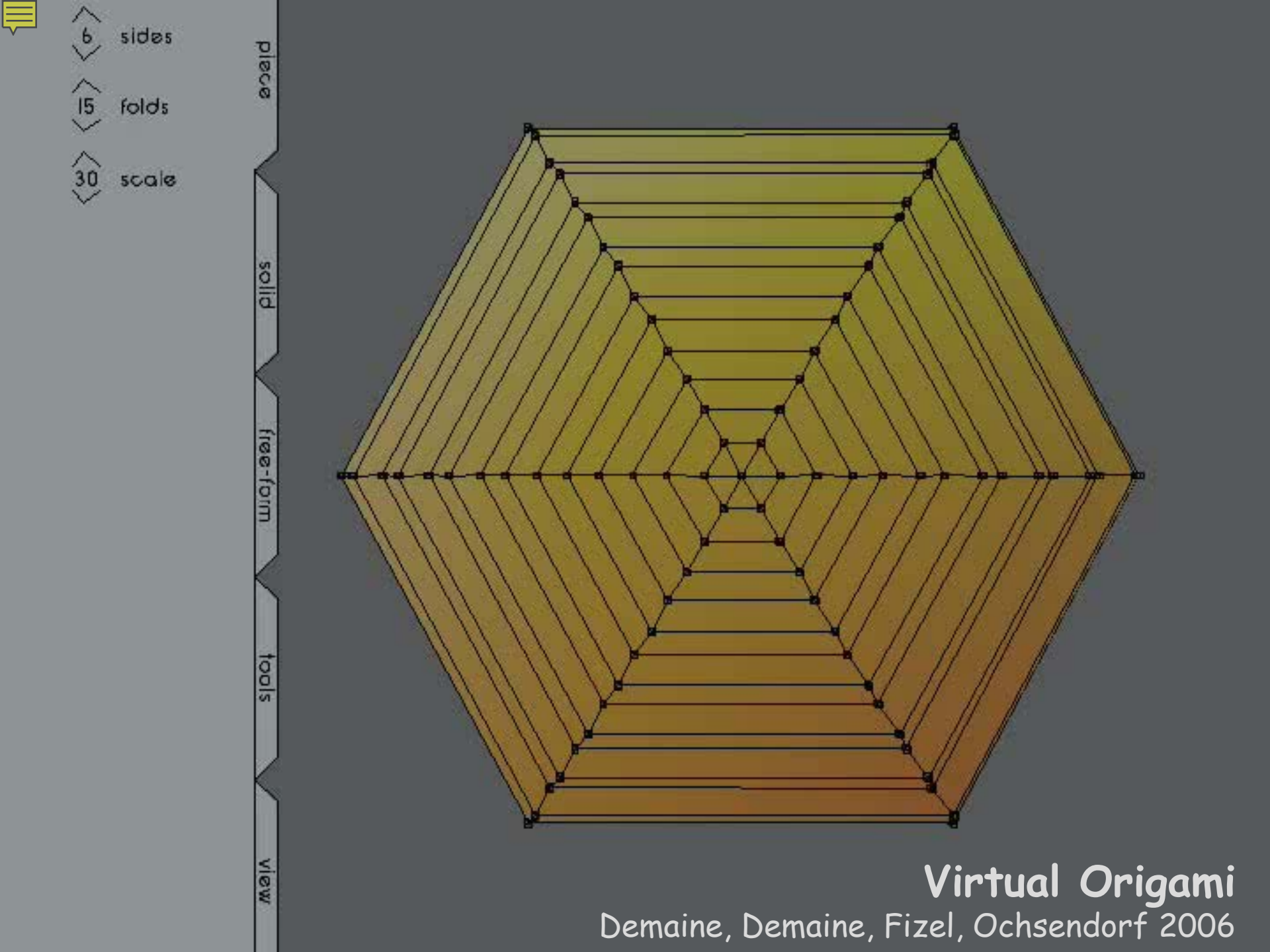

[Albers at Bauhaus, 1927-1928]

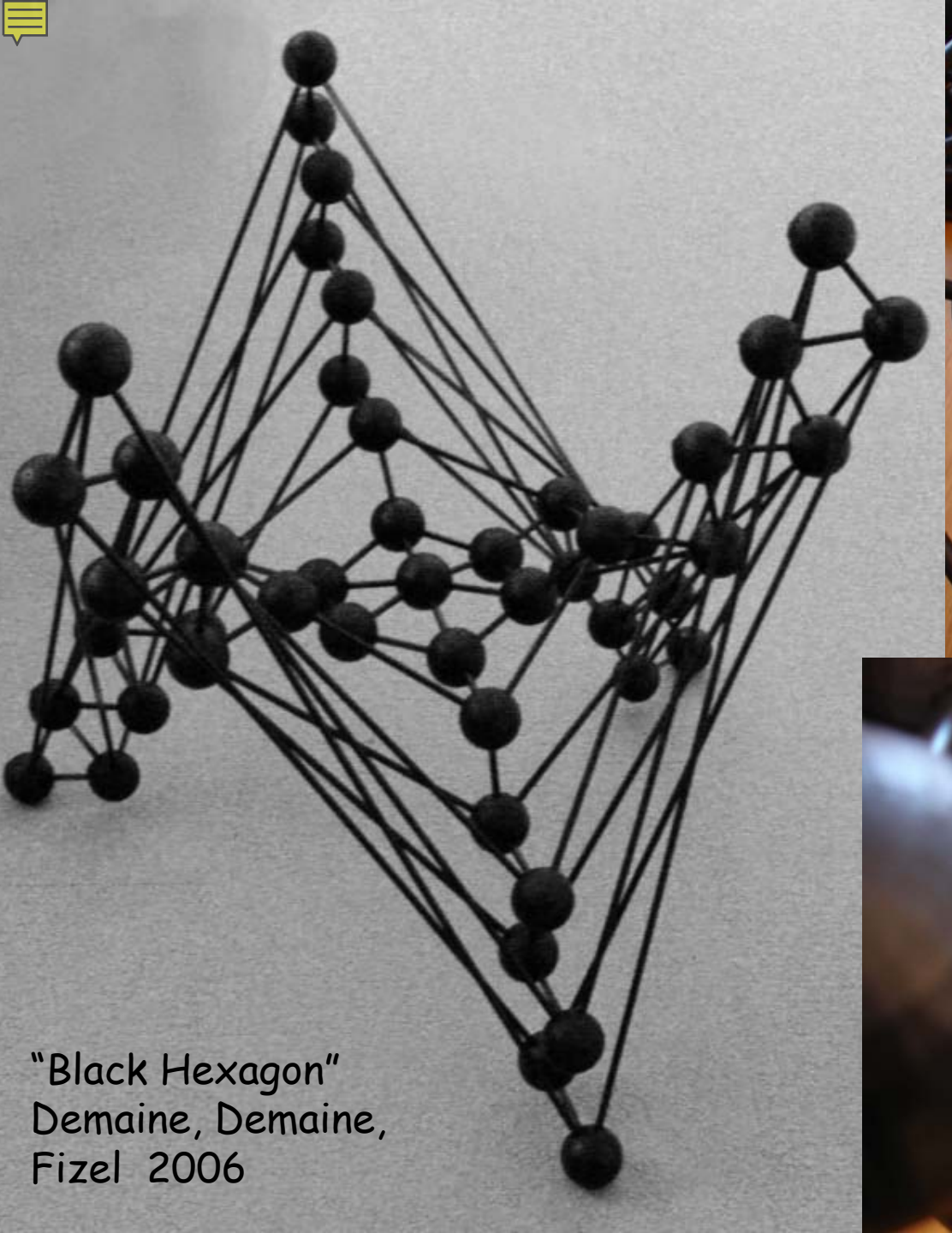

[Albers at Bauhaus, 1927-1928]



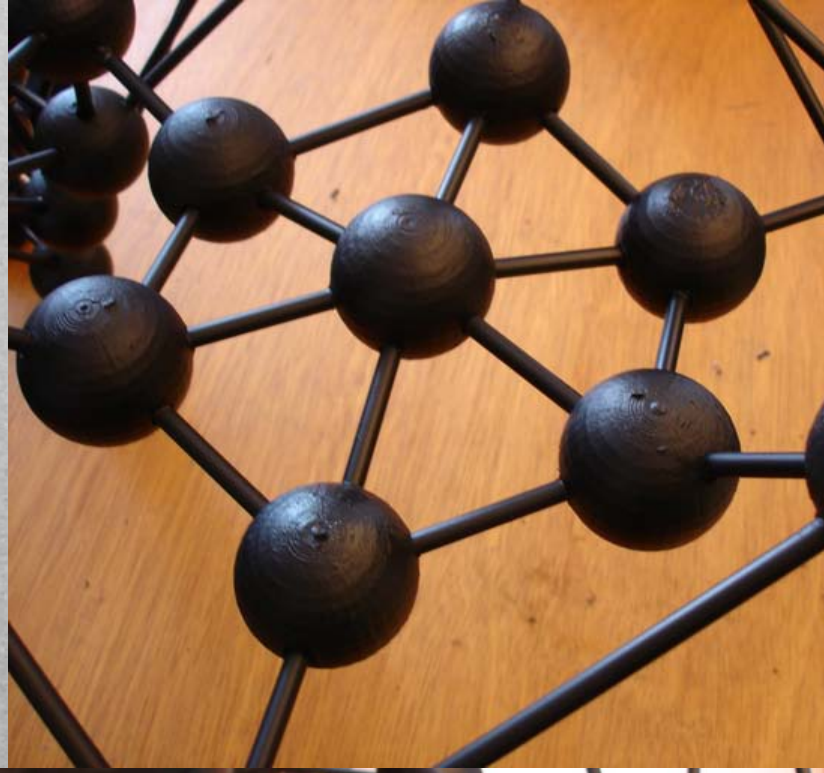
Virtual Origami

Demaine, Demaine, Fizel, Ochsendorf 2006


6 sides
15 folds
30 scale
place
solid
free-form
tools
view
Virtual Origami
Demaine, Demaine, Fizel, Ochsendorf 2006

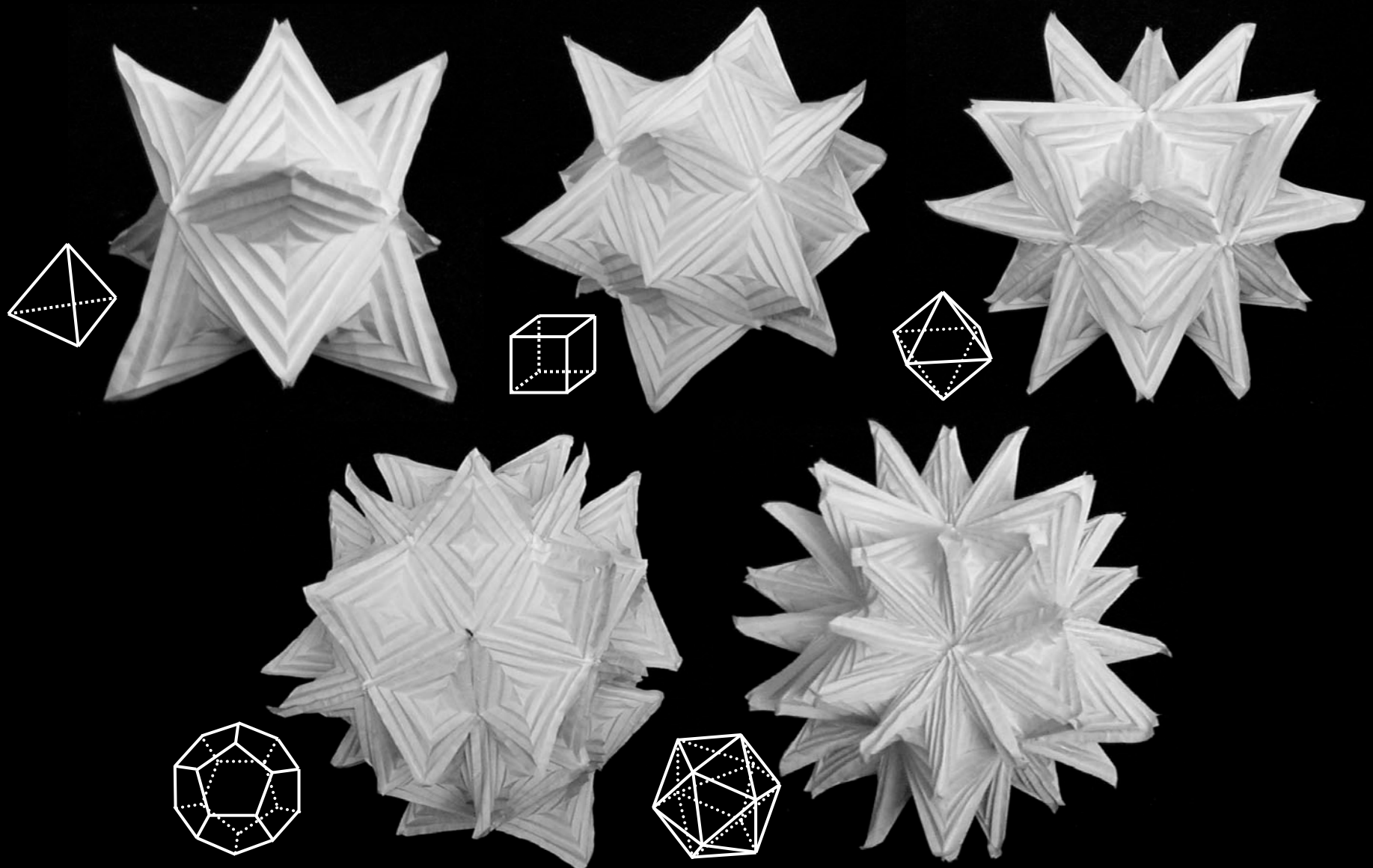


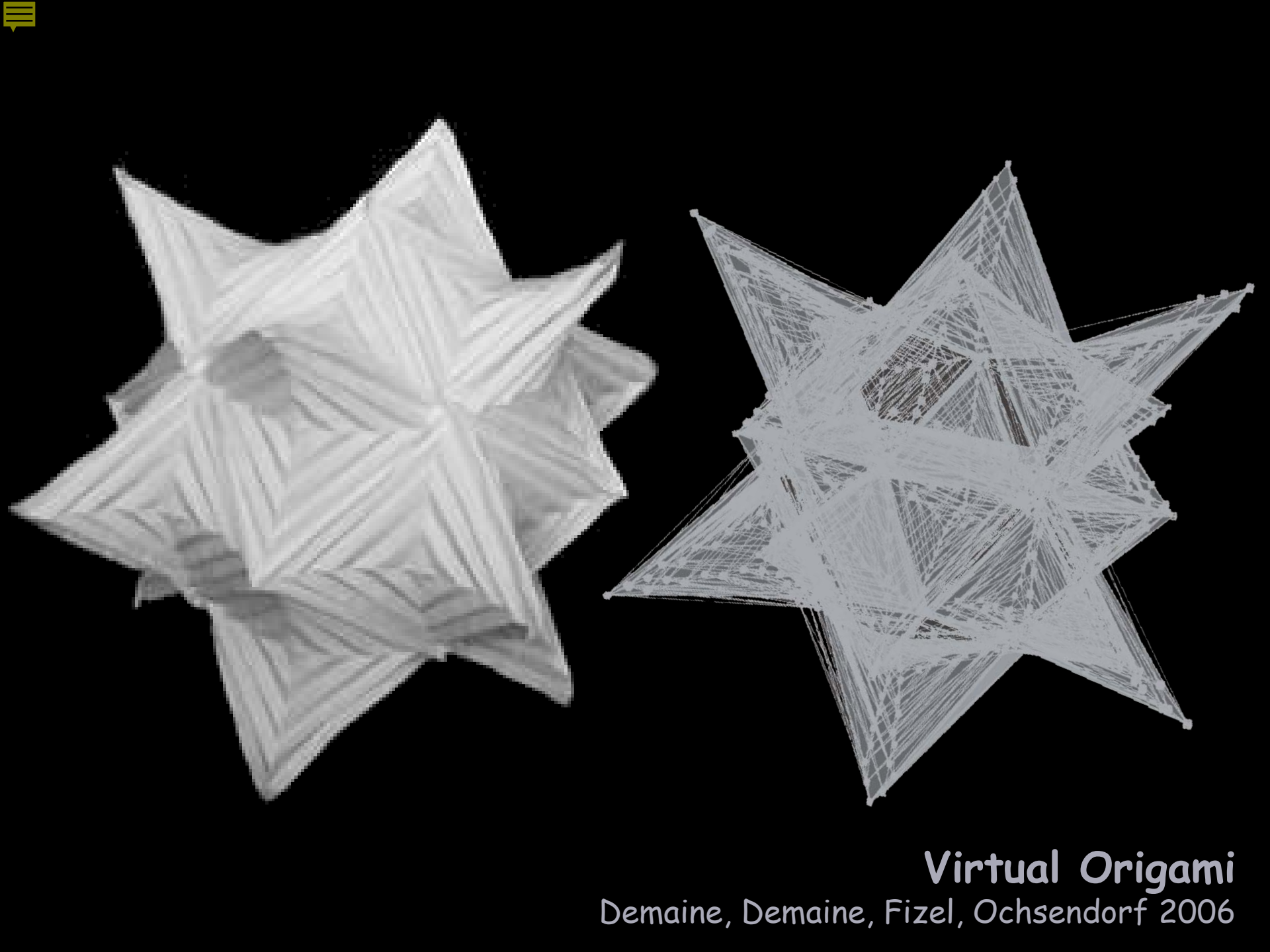
"Black Hexagon"
Demaine, Demaine,
Fizel 2006



Hyparhedra: Platonic Solids

[Demaine, Demaine, Lubiw 1999]





Virtual Origami

Demaine, Demaine, Fizel, Ochsendorf 2006

"Computational Origami"
Erik & Martin Demaine
MoMA, 2008-
Elephant hide paper
~9"x15"x7"

Peel Gallery, Houston

Nov. 2009

Demaine & Demaine 2009

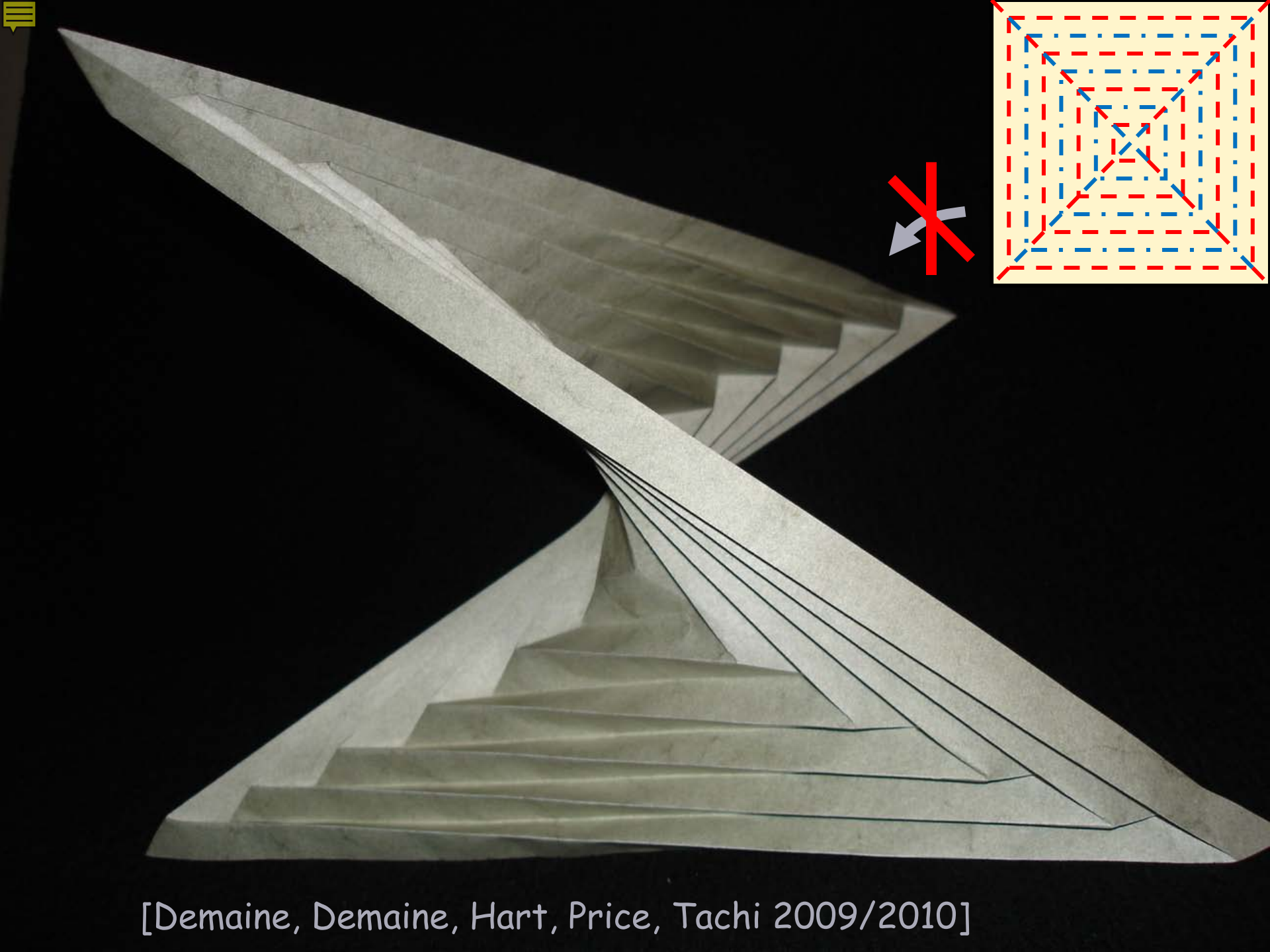
"Natural Cycles"
Erik & Martin Demaine

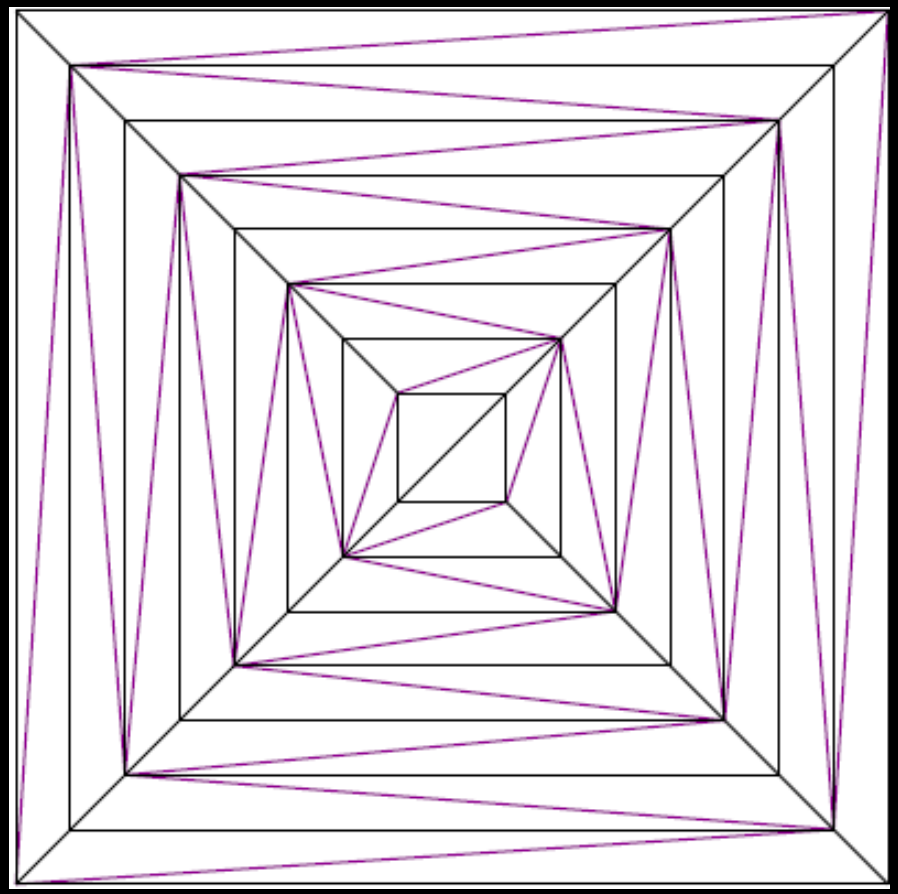
JMM Exhibition of
Mathematical Art,
San Francisco, 2010

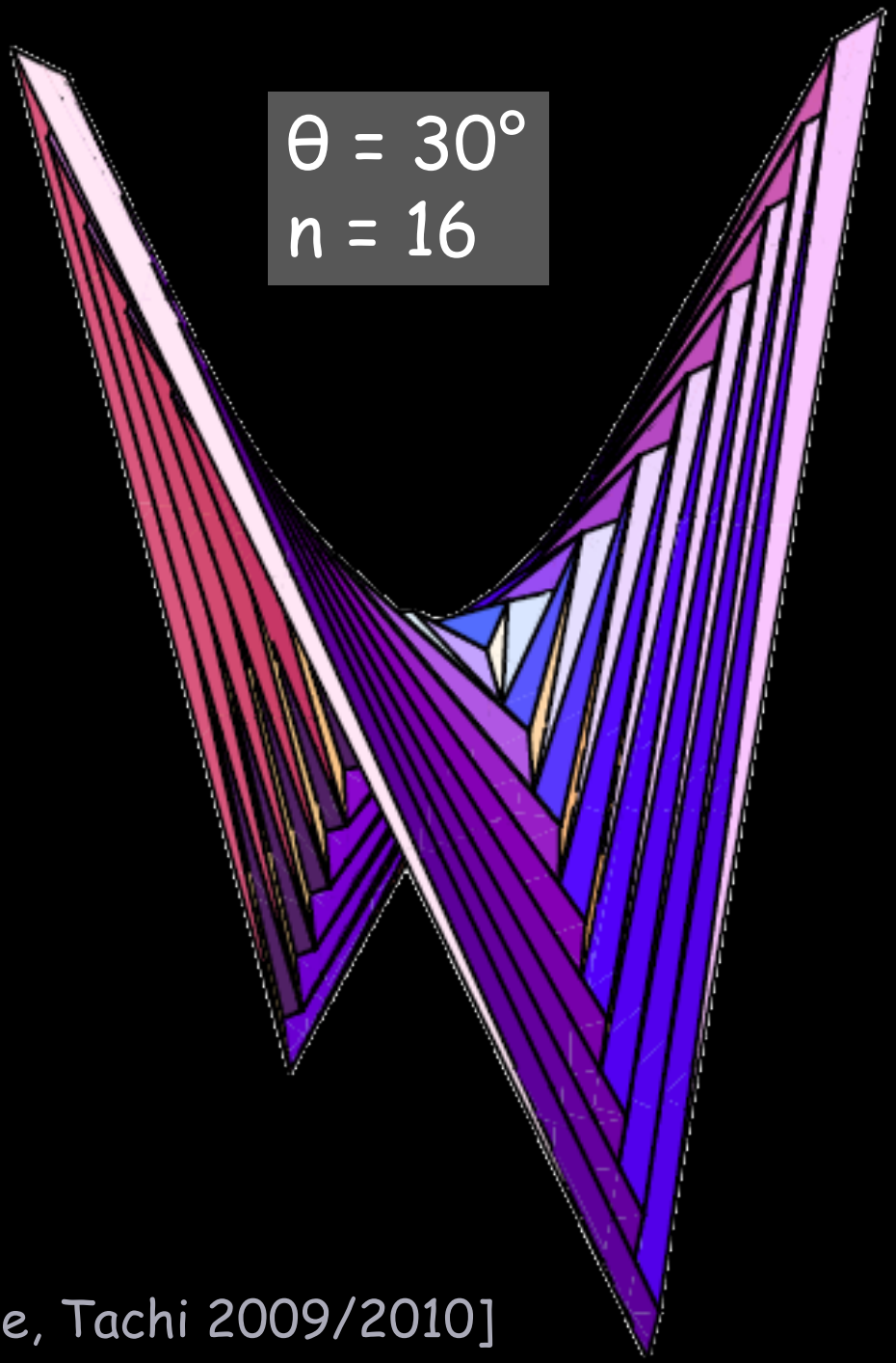
Waves in Glass

Erik Demaine
Martin Demaine

communication between glass & paper

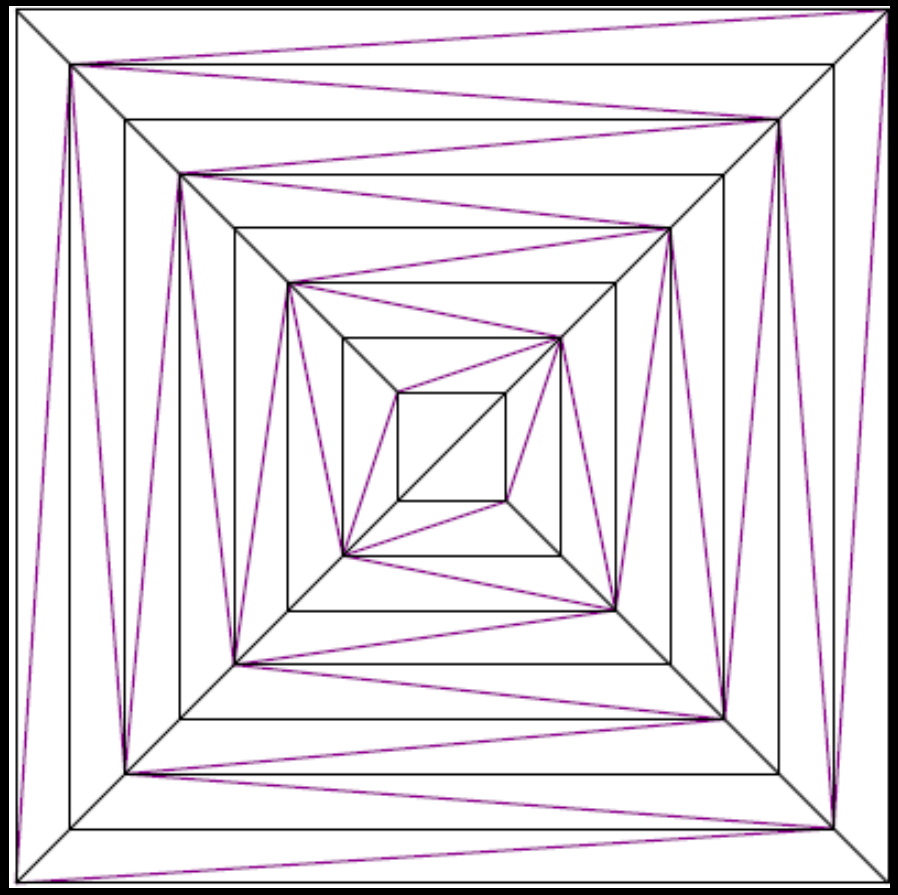

[Demaine, Demaine, Hart, Price, Tachi 2009/2010]





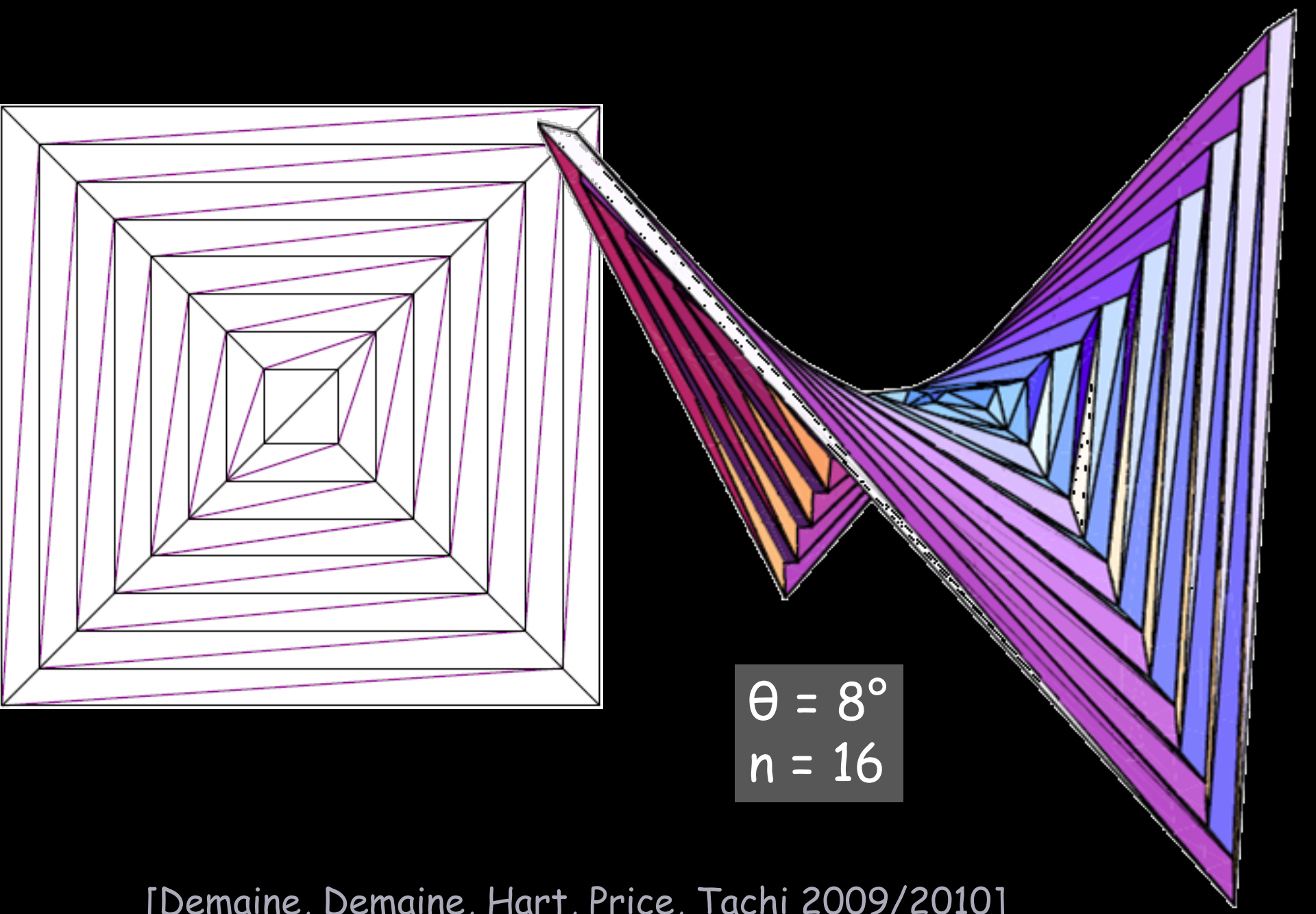
[Demaine, Demaine, Hart, Price, Tachi 2009/2010]

[Demaine, Demaine, Hart, Price, Tachi 2009/2010]

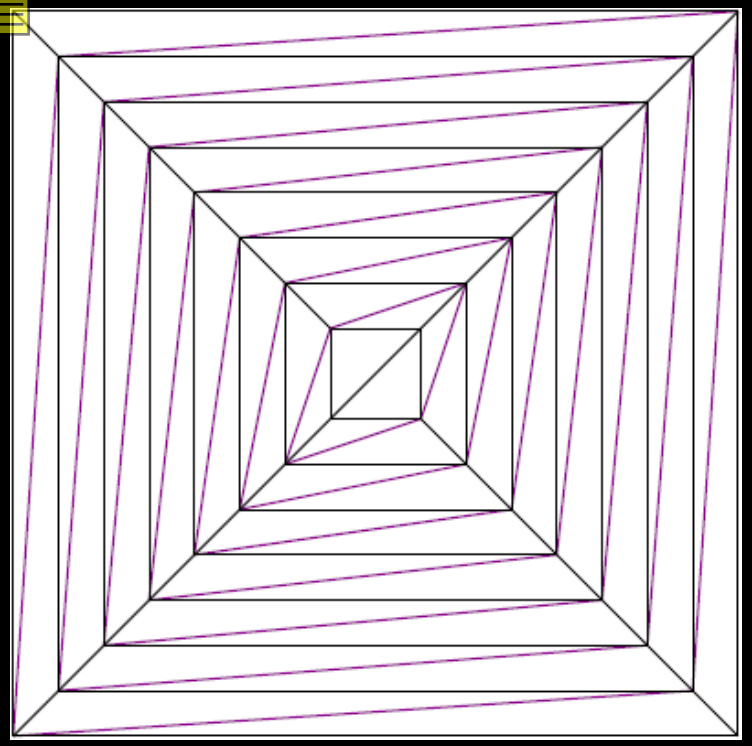


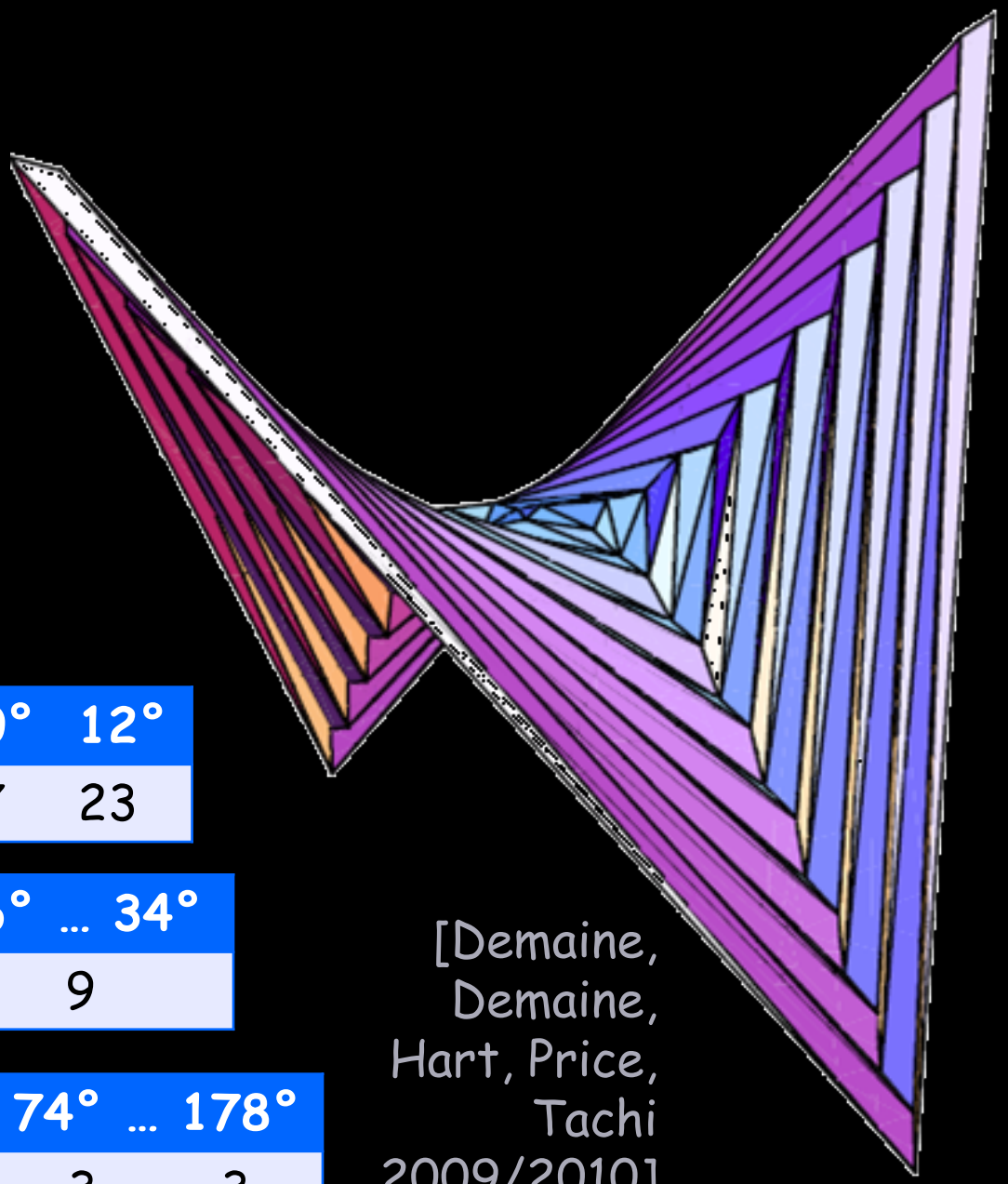
[Demaine, Demaine, Hart, Price, Tachi 2009/2010]

digits of precision	16	32	64	128	256	512	1024	2048
n for $\theta = 1°$ alt.	3	6	12	24	43	79	≥ 100	
n for $\theta = 45°$ alt.	3	5	10	18	32	58	≥ 100	
n for $\theta = 76°$ alt.	2	5	9	16	29	53	95	≥ 100



[Demaine, Demaine, Hart, Price, Tachi 2009/2010]



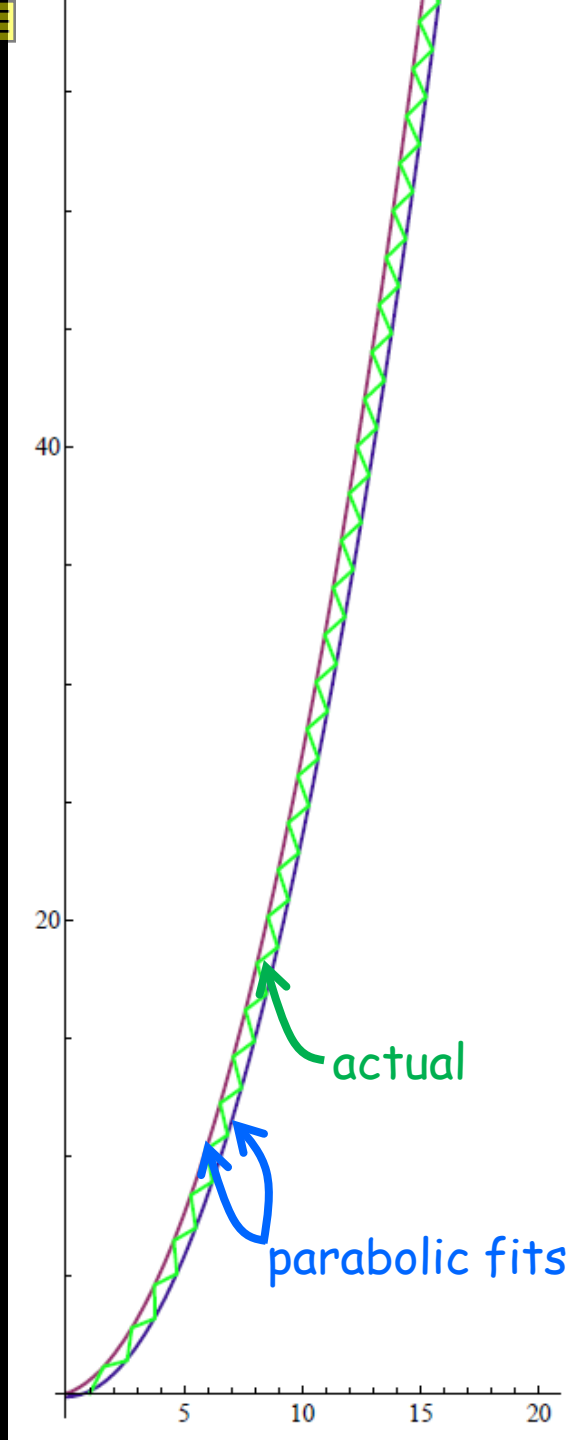


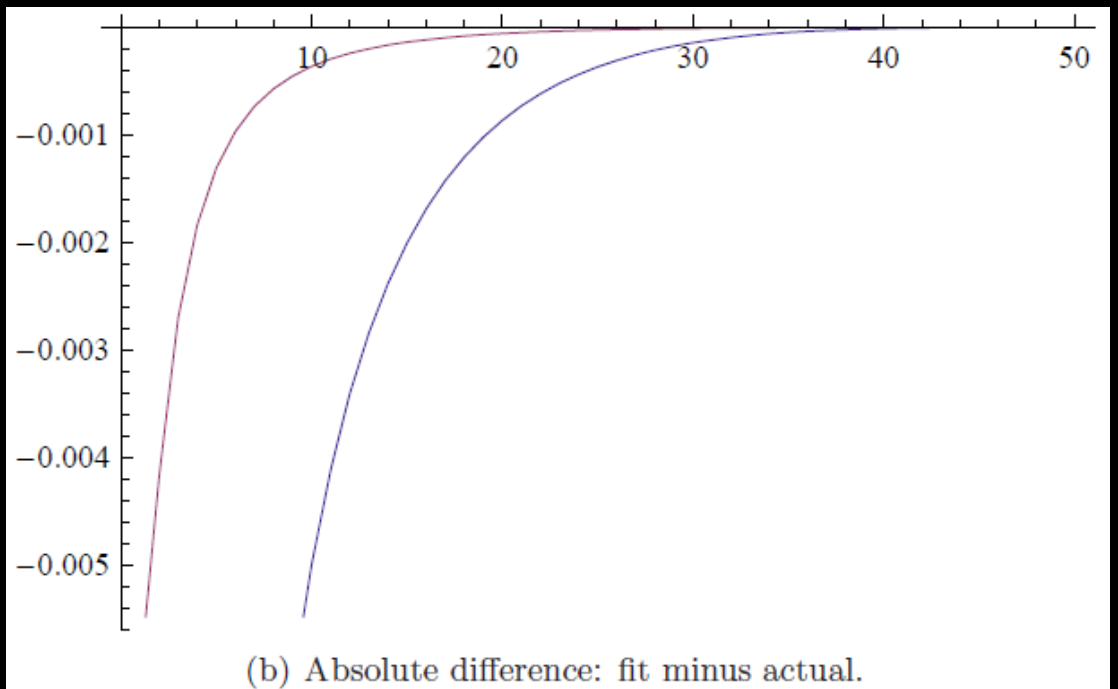
θ =	2°	4°	6°	8°	10°	12°
n ≤	133	67	45	33	27	23

θ =	18°	20°	22°	24°	26°	…	34°
n ≤	15	13	13	11		9	

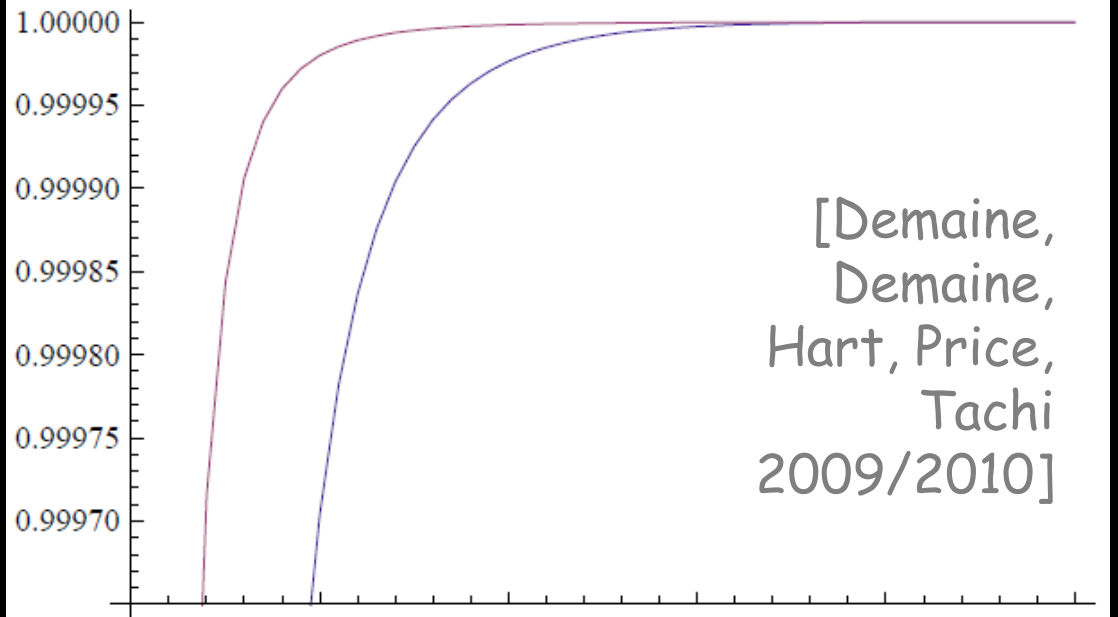
θ =	36°	…	46°	48°	…	72°	74°	…	178°
n ≤	7	…	7	5	…	5	3	…	3

[Demaine, Demaine, Hart, Price, Tachi 2009/2010]



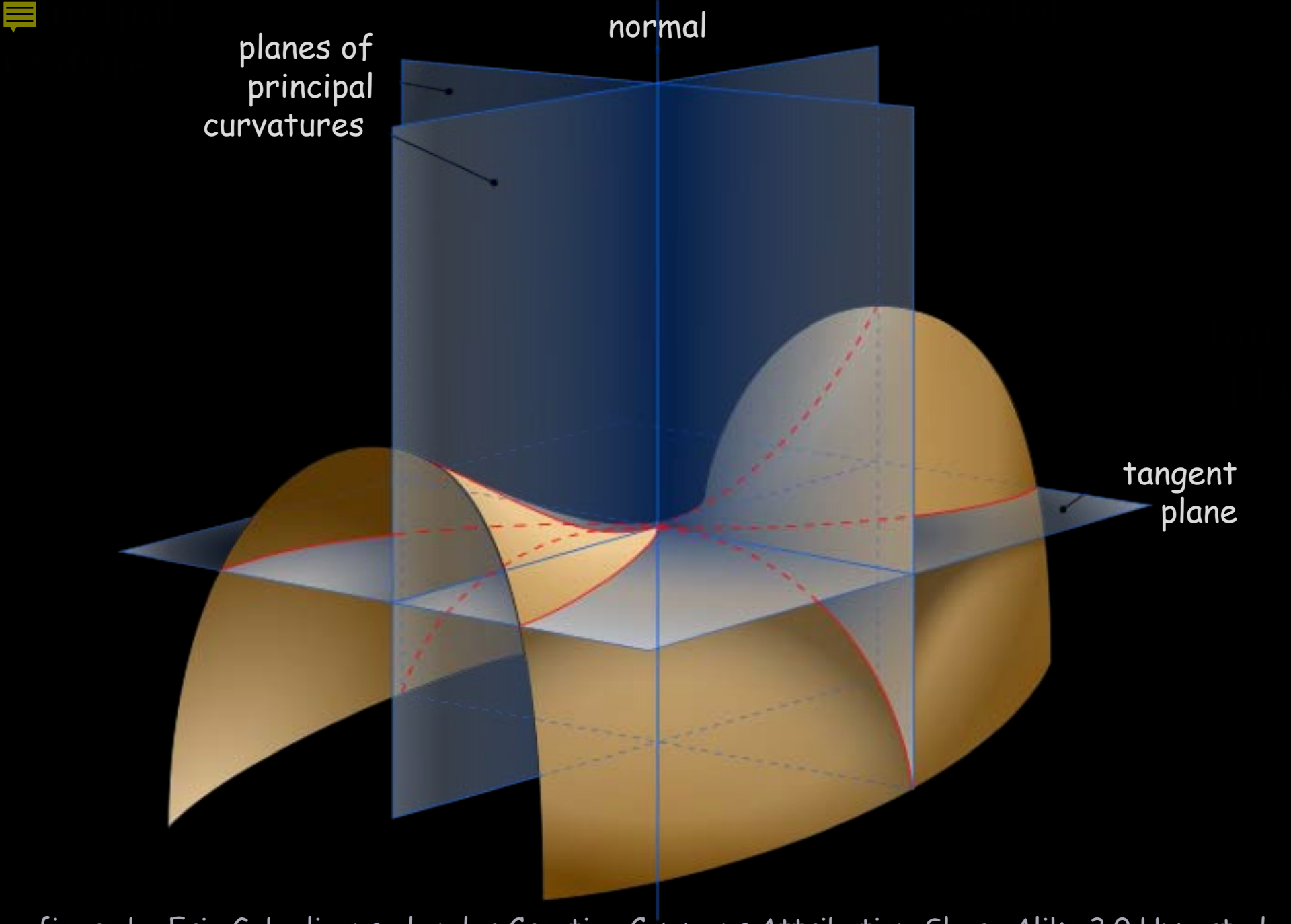


(b) Absolute difference: fit minus actual.



(c) Relative difference: fit over actual.

[Demaine, Demaine, Hart, Price, Tachi 2009/2010]



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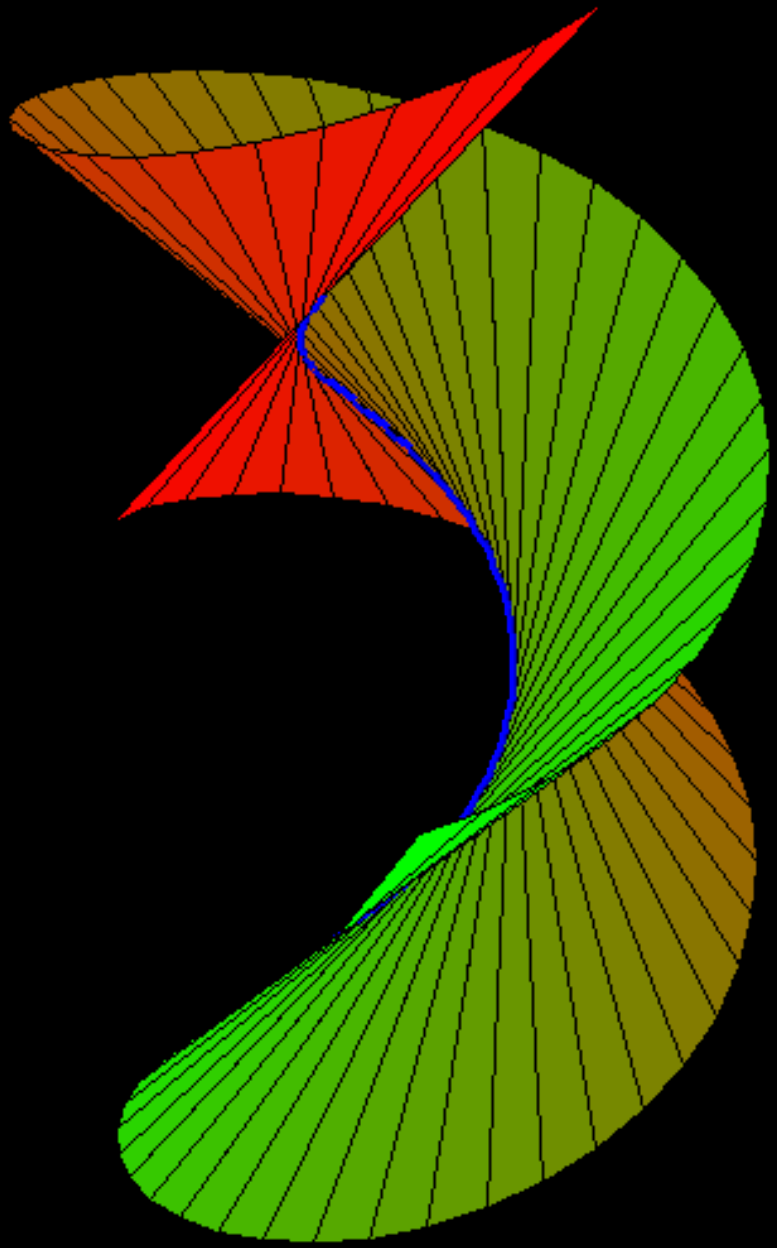

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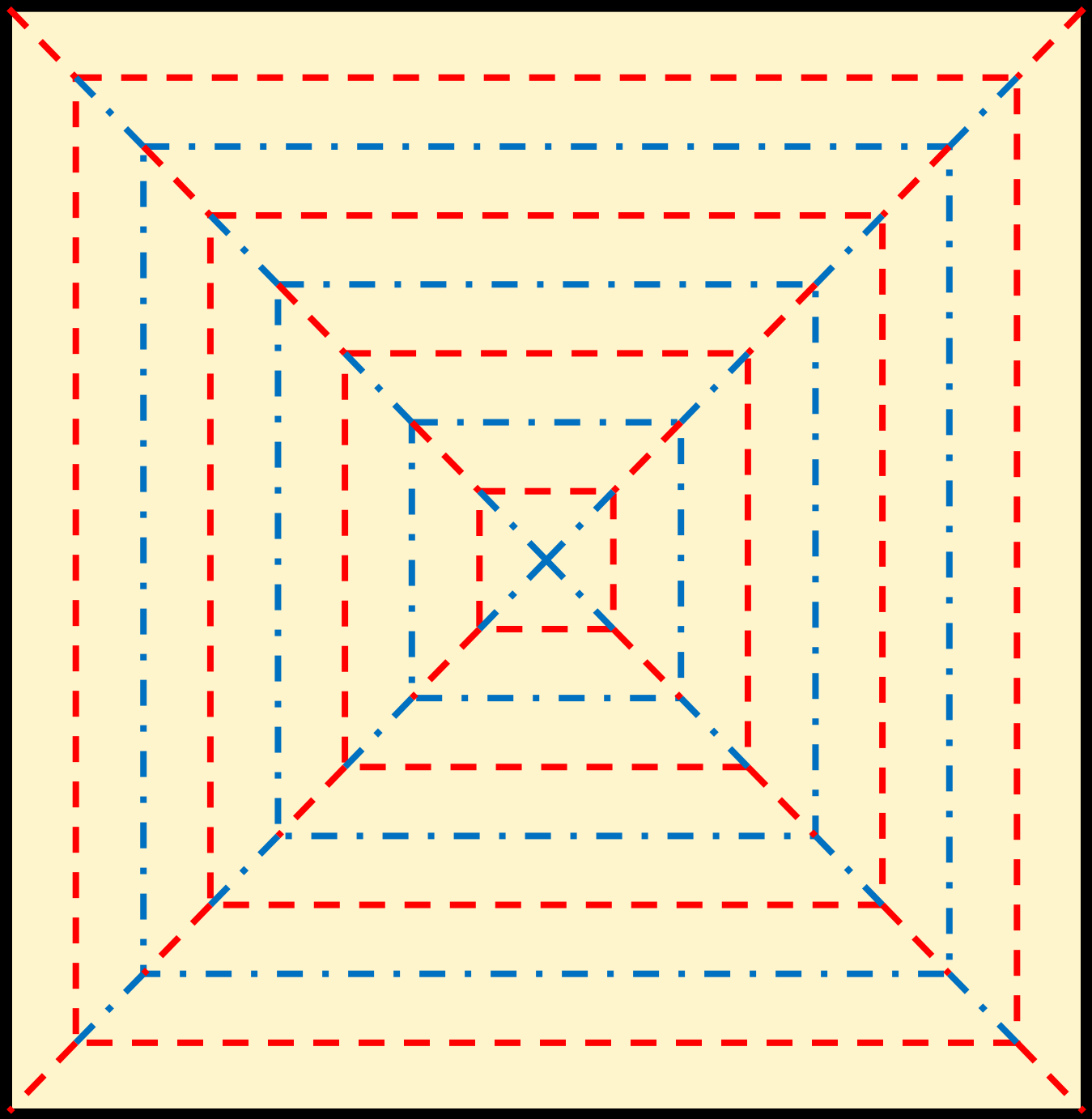
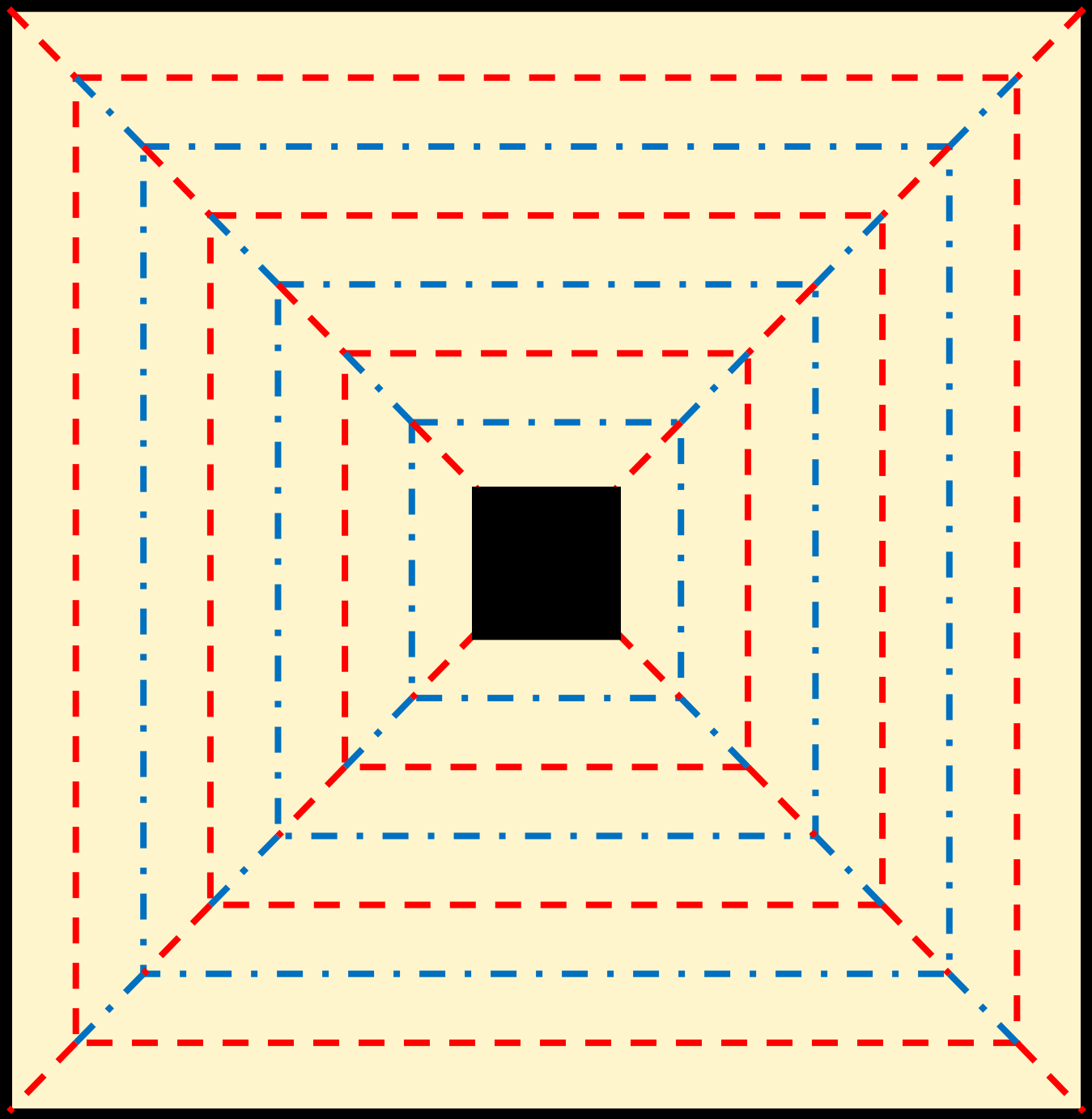
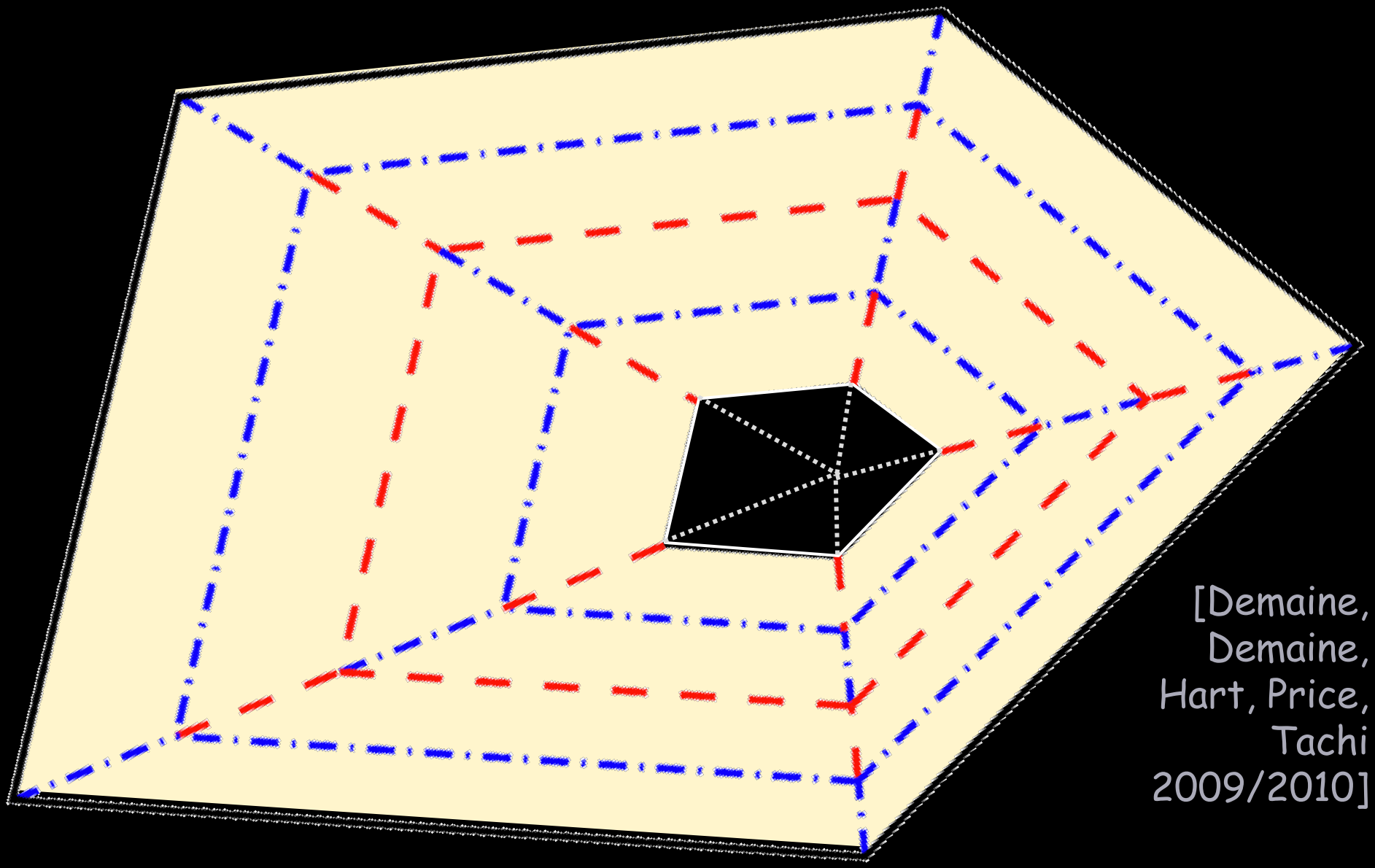


[Demaine, Demaine, Hart, Price, Tachi 2009/2010]



[Demaine, Demaine, Hart, Price, Tachi 2009/2010]



[Demaine, Demaine, Hart, Price, Tachi 2009/2010]

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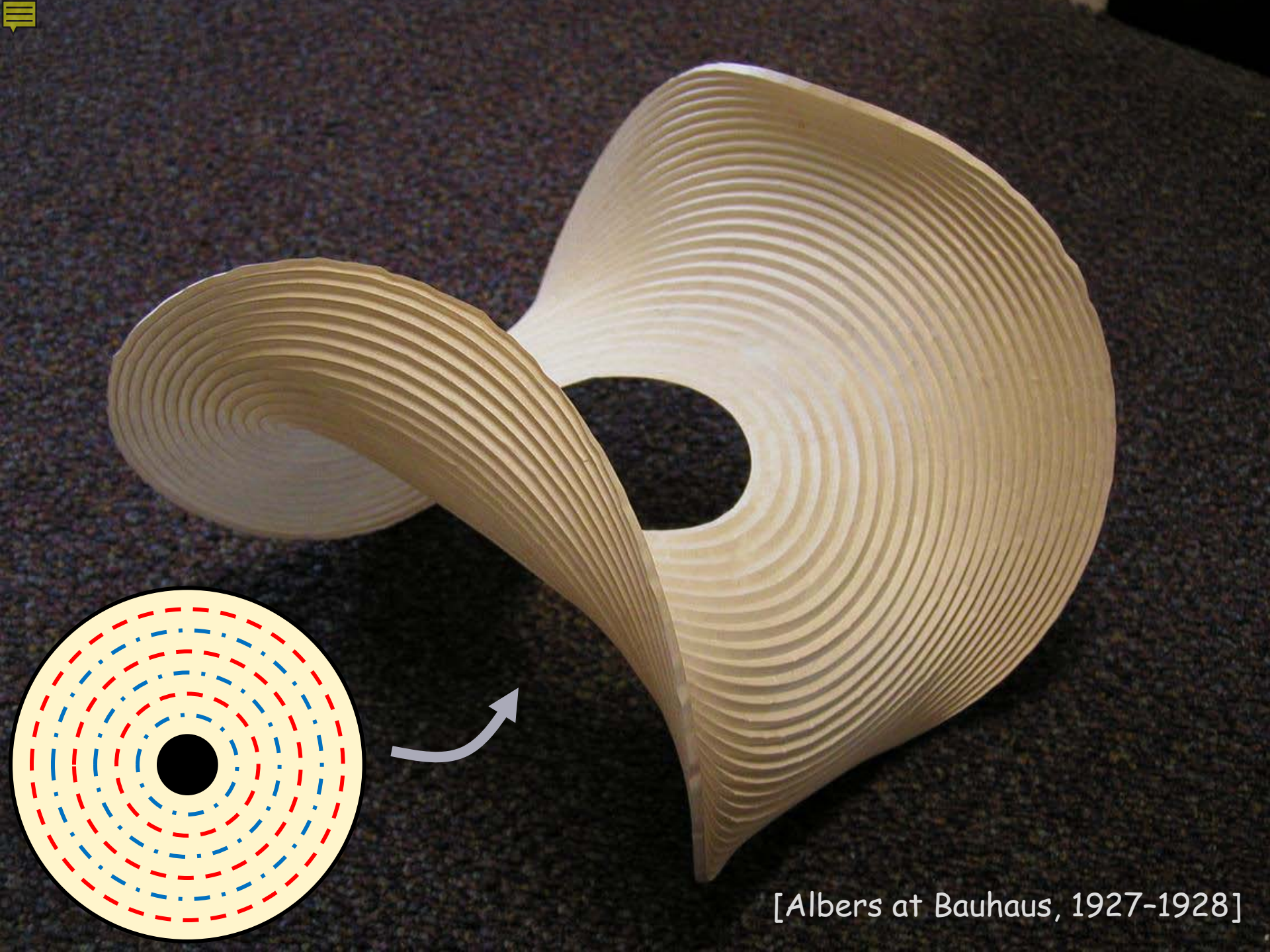
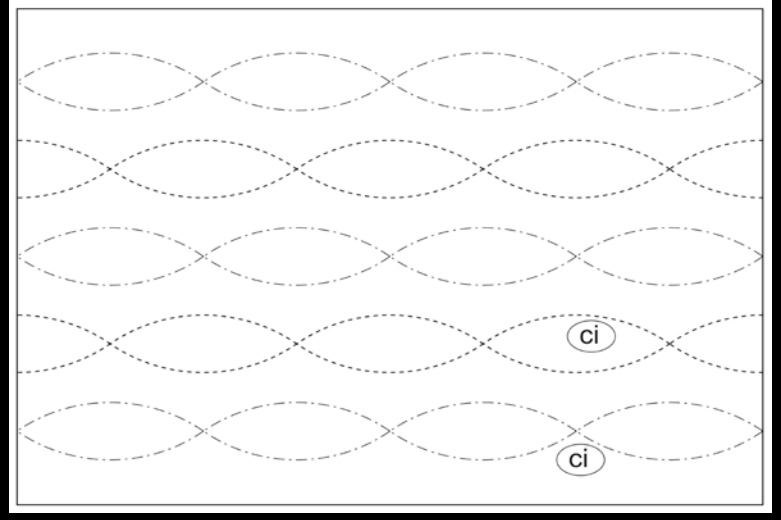
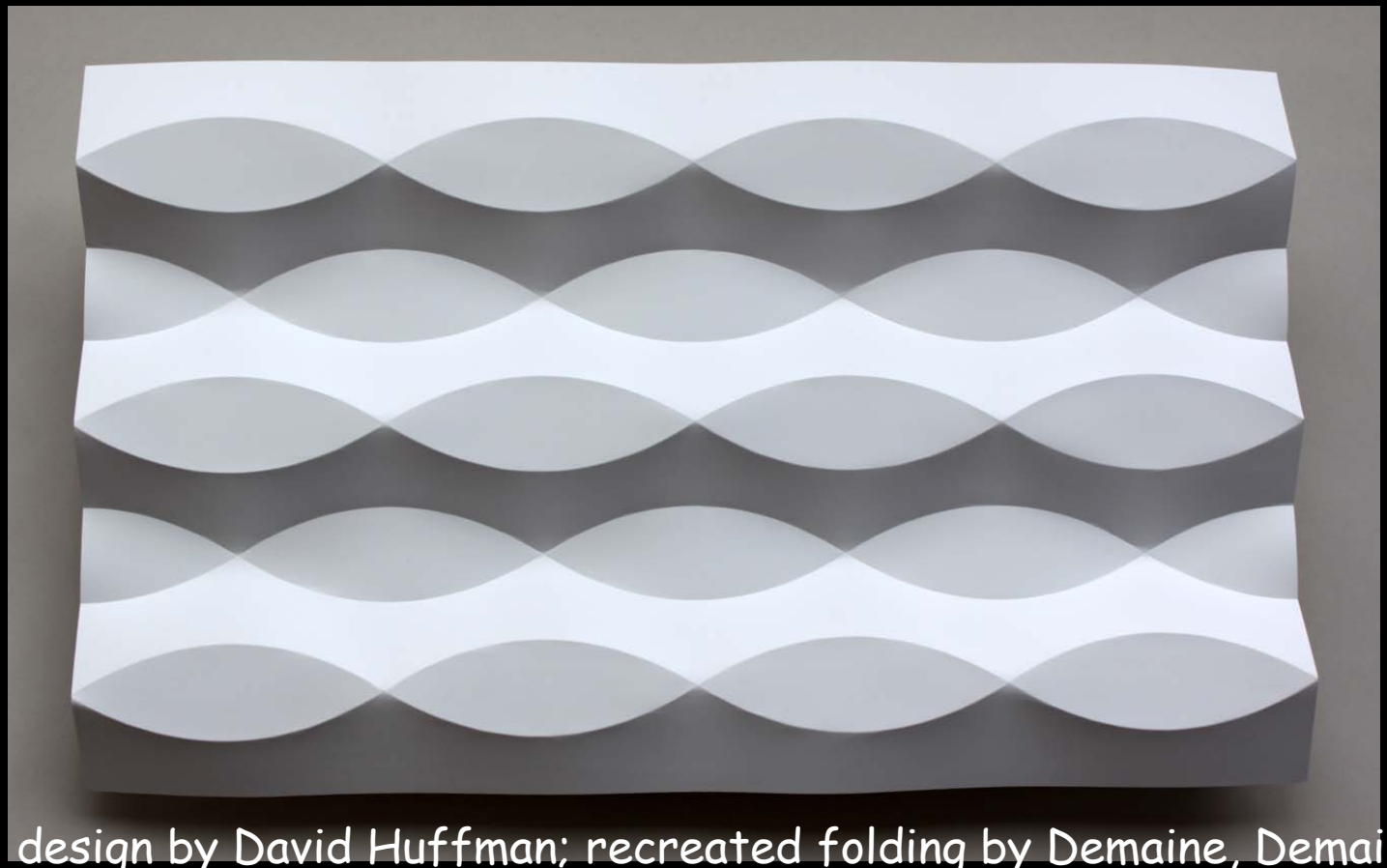

[Albers at Bauhaus, 1927-1928]

Huffman Family (May 2010)

Tessellations

circles

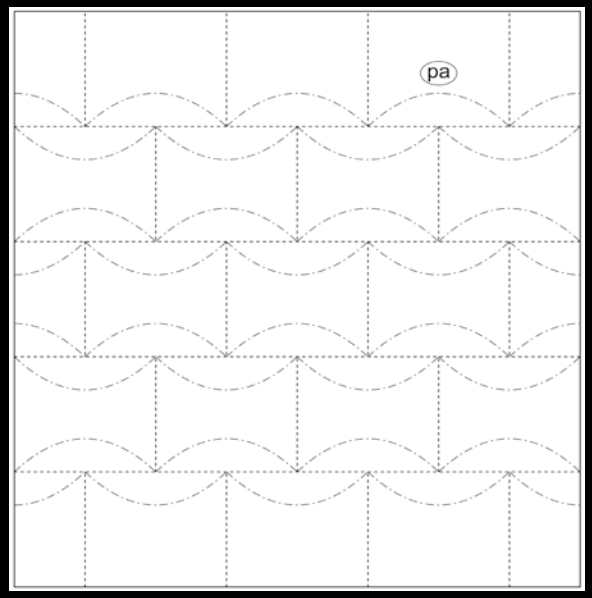




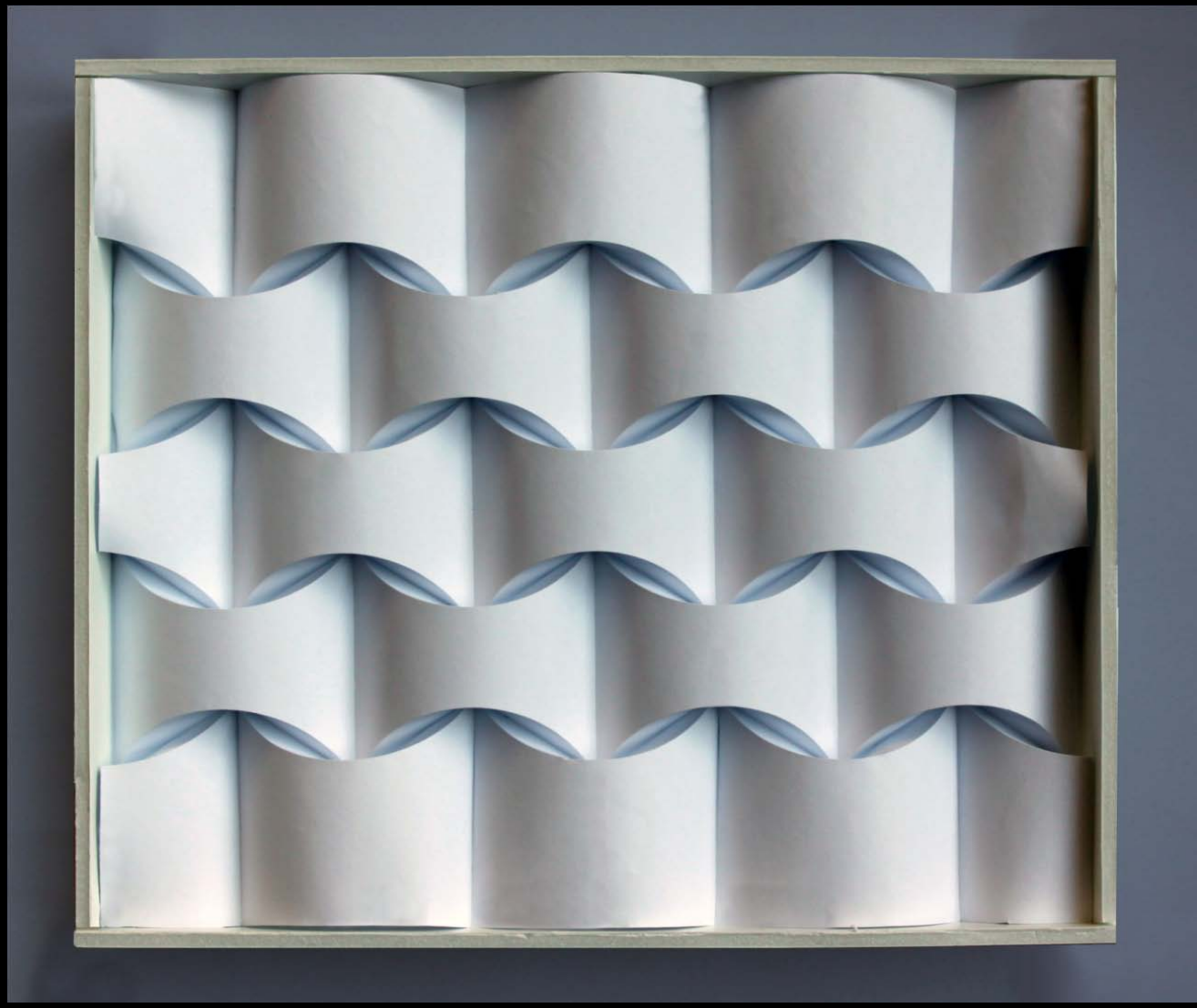
design by David Huffman; recreated folding by Demaine, Demaine, Koschitz 2010

Tessellations

"Arches"

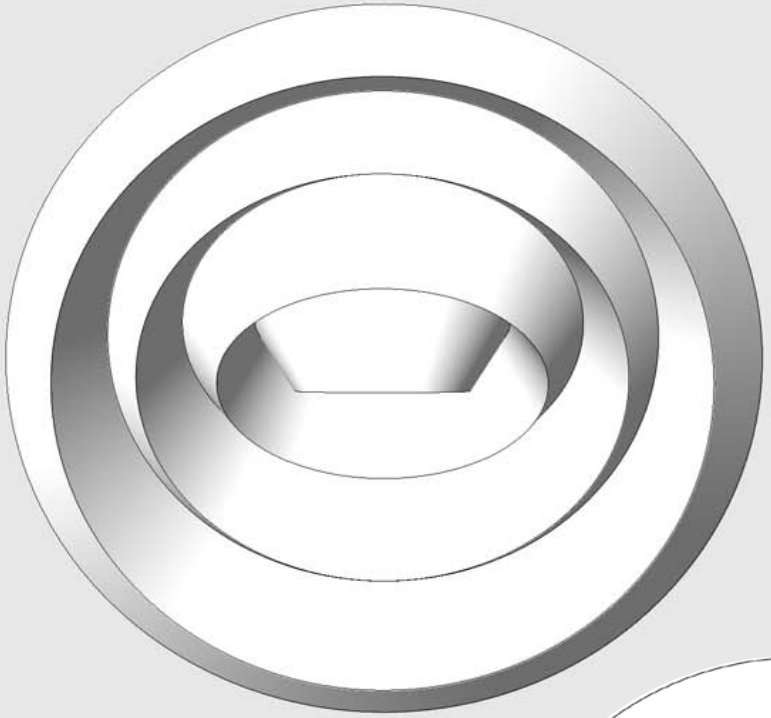


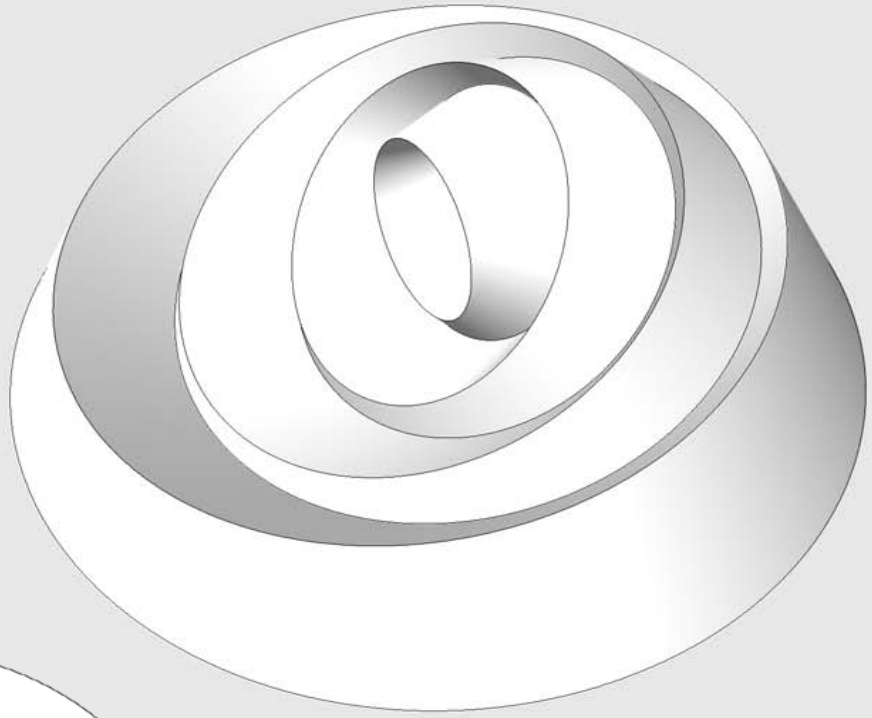
parabolas
& lines

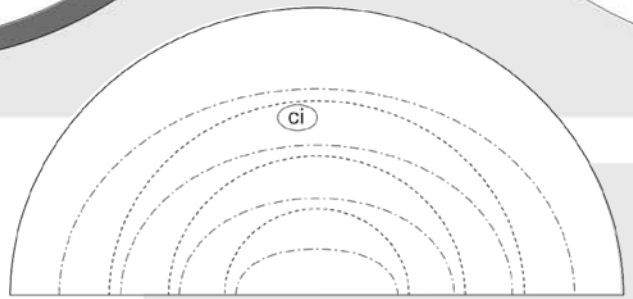


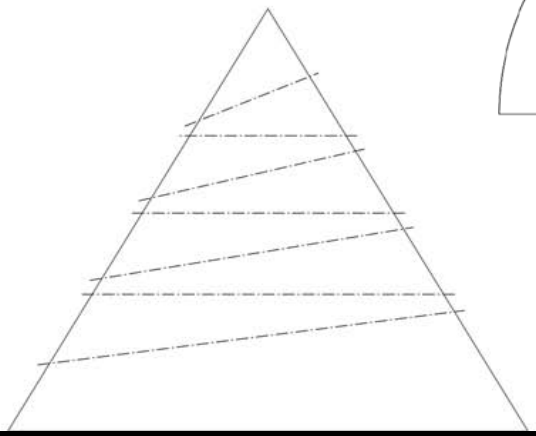
design by David Huffman; recreated folding by Demaine, Demaine, Koschitz 2010

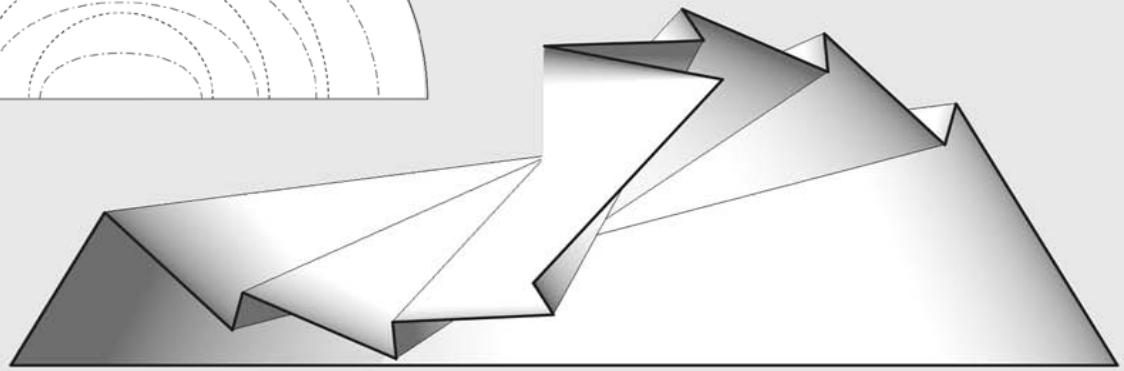
"Cone reflected 7 times"







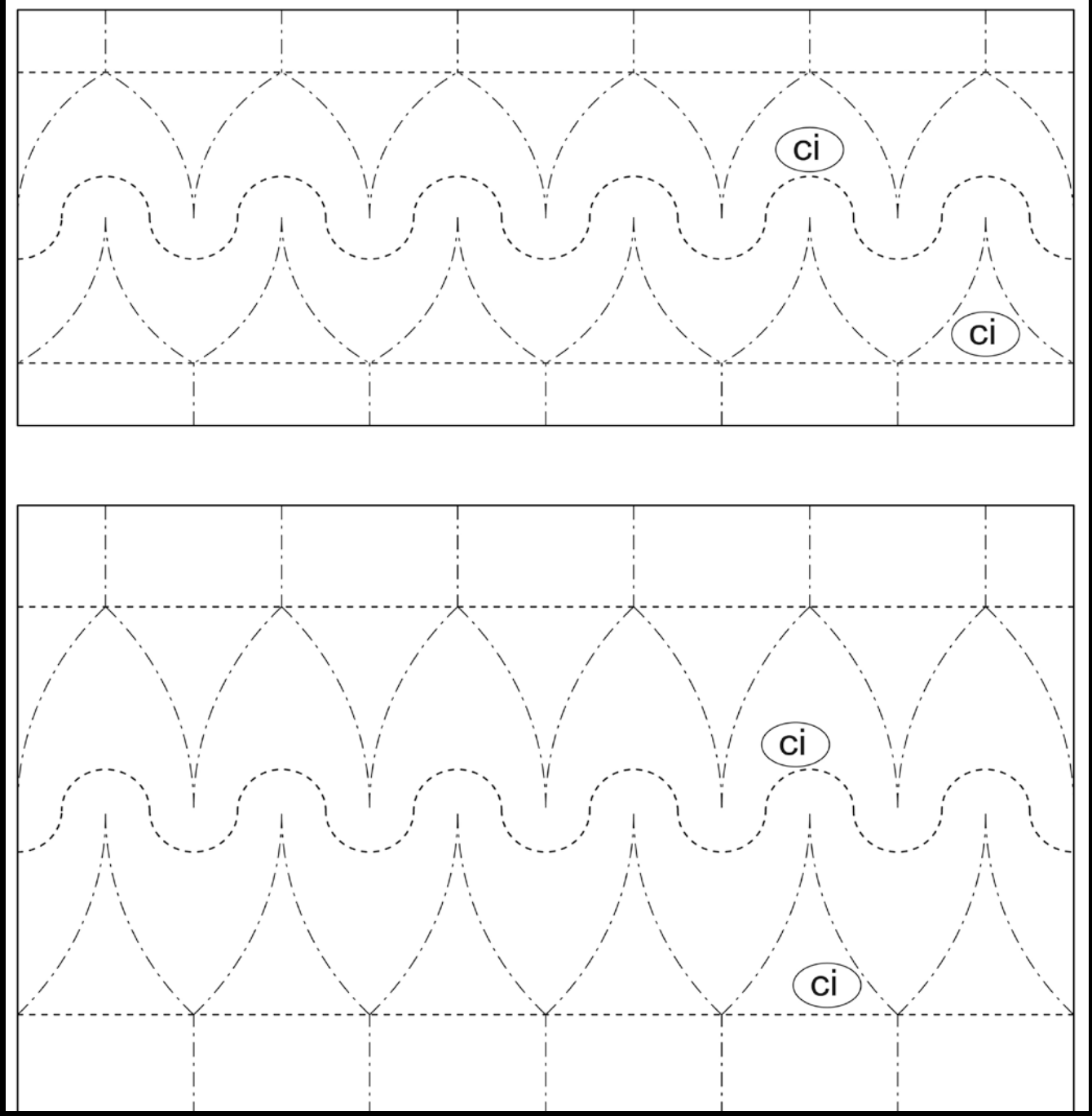




"Hexagonal column with cusps"

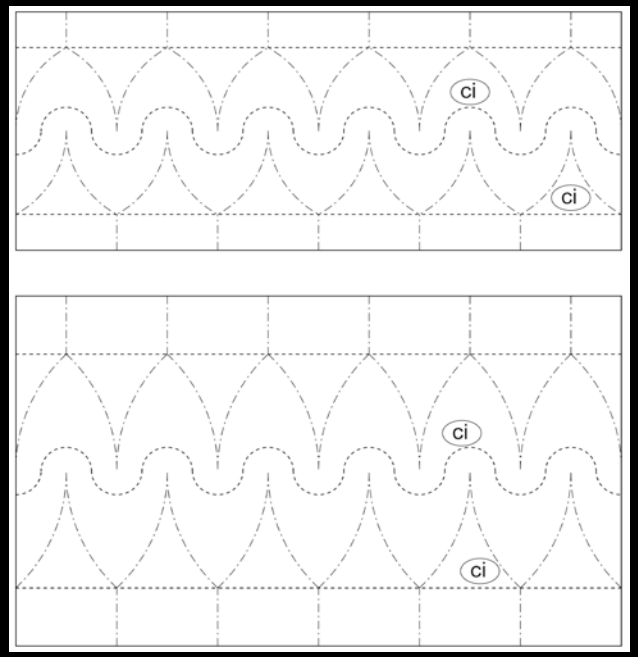
(two variations)

circles & lines



design by David Huffman; recreated folding by Demaine, Demaine, Koschitz 2010

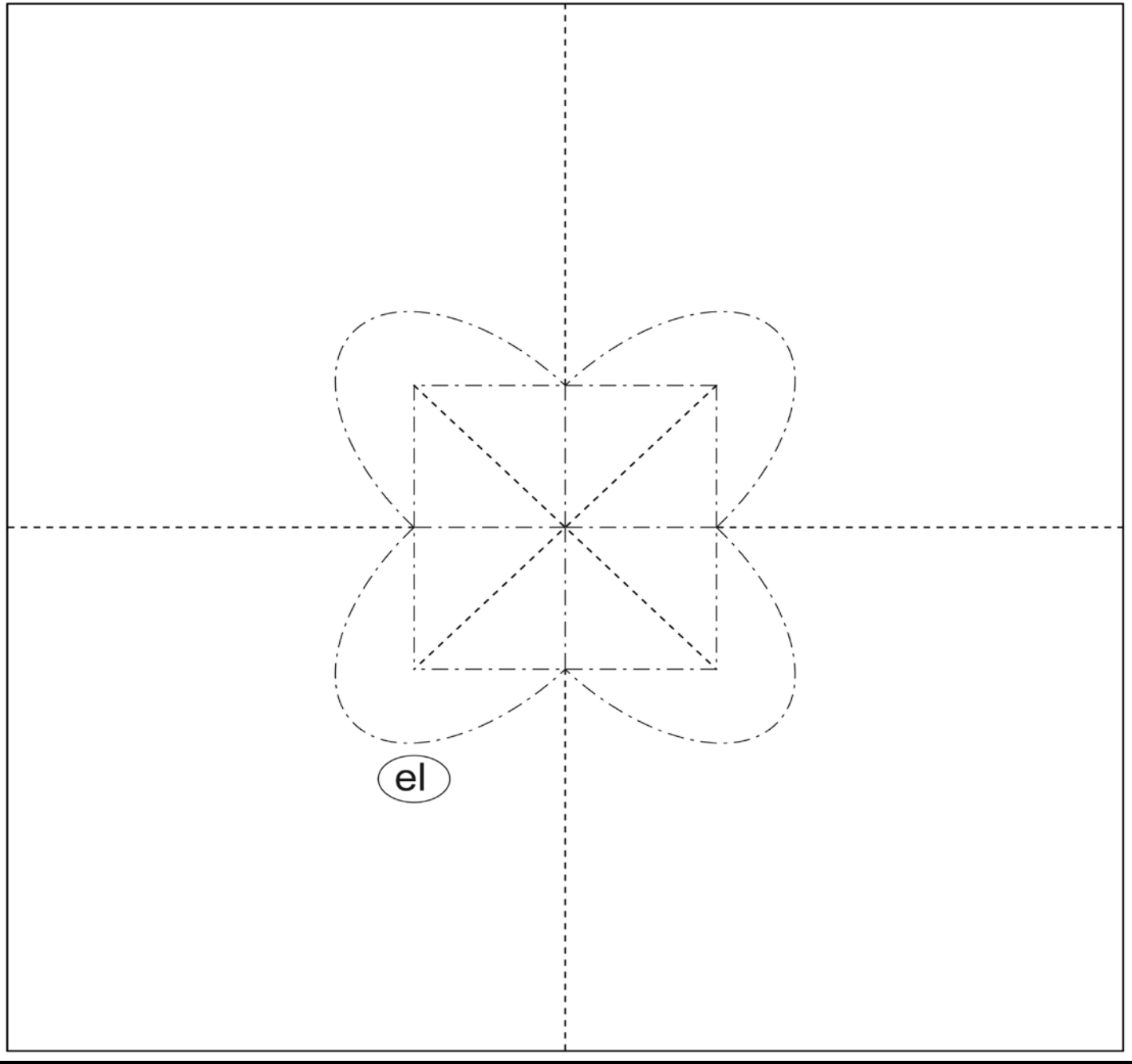
"Hexagonal column with cusps"



circles & lines

design by David Huffman; recreated folding by Demaine, Demaine, Koschitz 2010

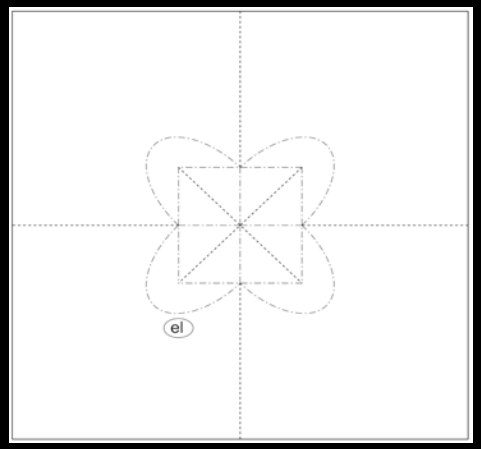
"4-lobed cloverleaf"



ellipses & lines

design by David Huffman; recreated folding by Demaine, Demaine, Koschitz 2010

"4-lobed cloverleaf"

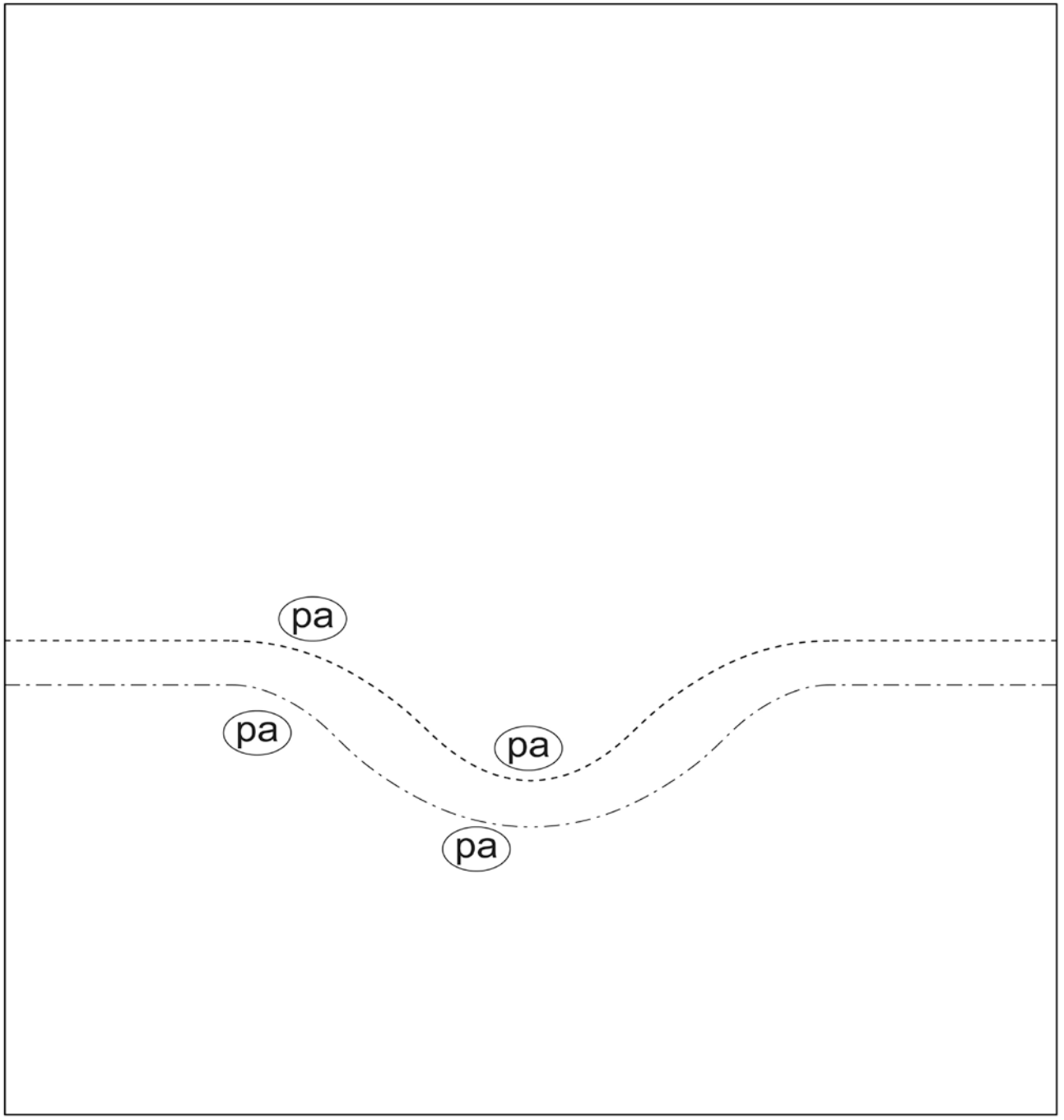


ellipses & lines

design by David Huffman; recreated folding by Demaine, Demaine, Koschitz 2010

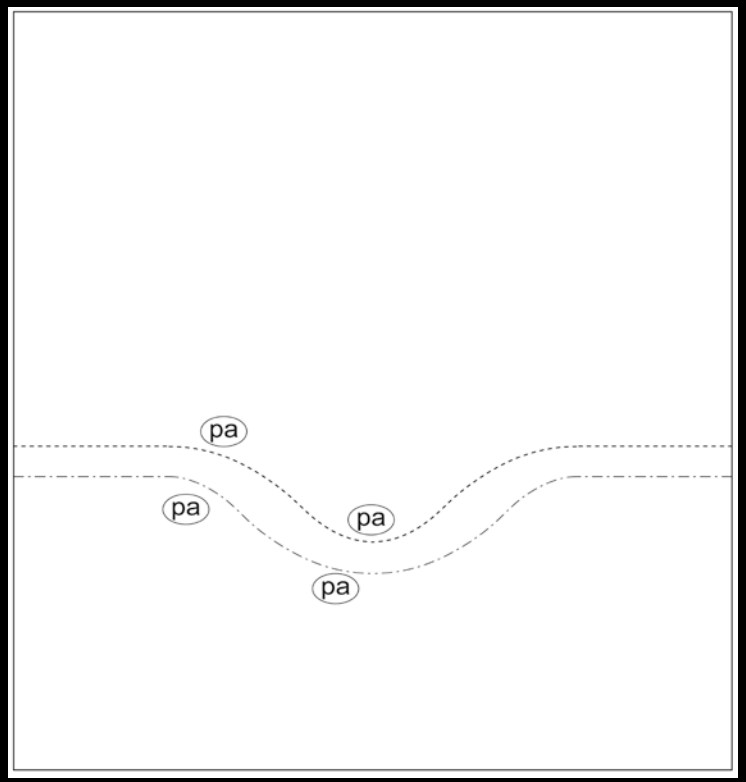
"One column"

parabolas
& lines

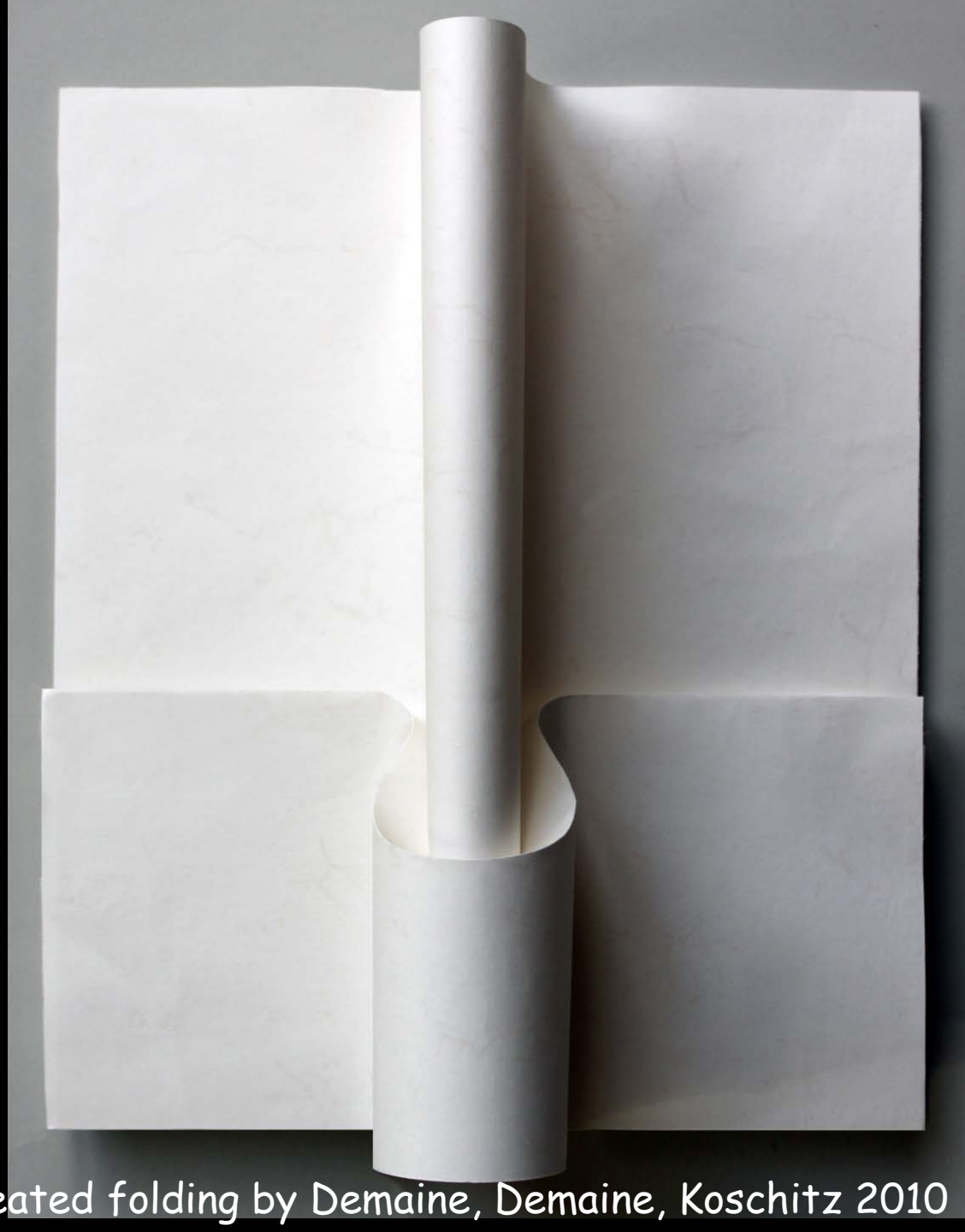


design by David Huffman; recreated folding by Demaine, Demaine, Koschitz 2010

"One column"



parabolas
& lines



design by David Huffman; recreated folding by Demaine, Demaine, Koschitz 2010

Huffman Family (May 2010)