



# The Intersection Of Art and Physics

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University of Washington  
Bothell and Seattle

November 8, 2006  
Department of Physics Colloquium  
University of Wisconsin, Madison

*Dedicated to the memory of Prof. Mark McDermott*

# Outline

Ancient Connections

Egypt

Renaissance

“Beauty”

Modern Connections

Fractals

Simulations

My work

# Outline

## Ancient Connections

Egypt

Renaissance

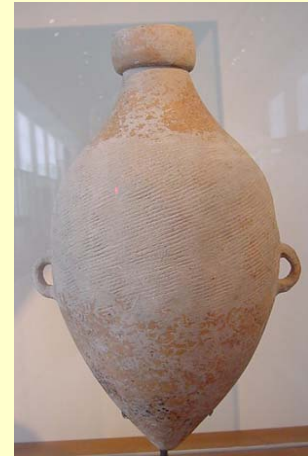
“Beauty”

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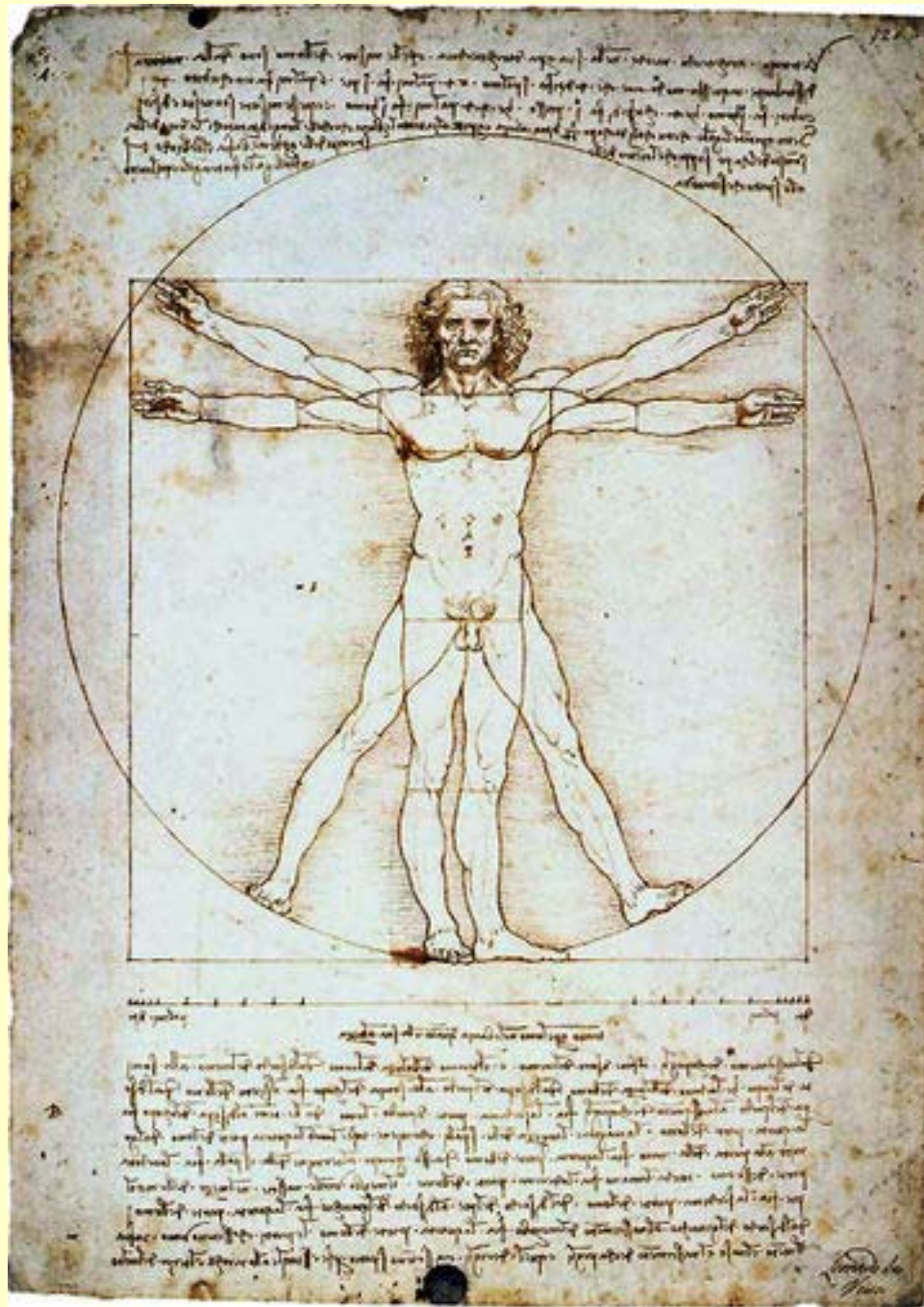
jar from Ban'po, 4800 BC



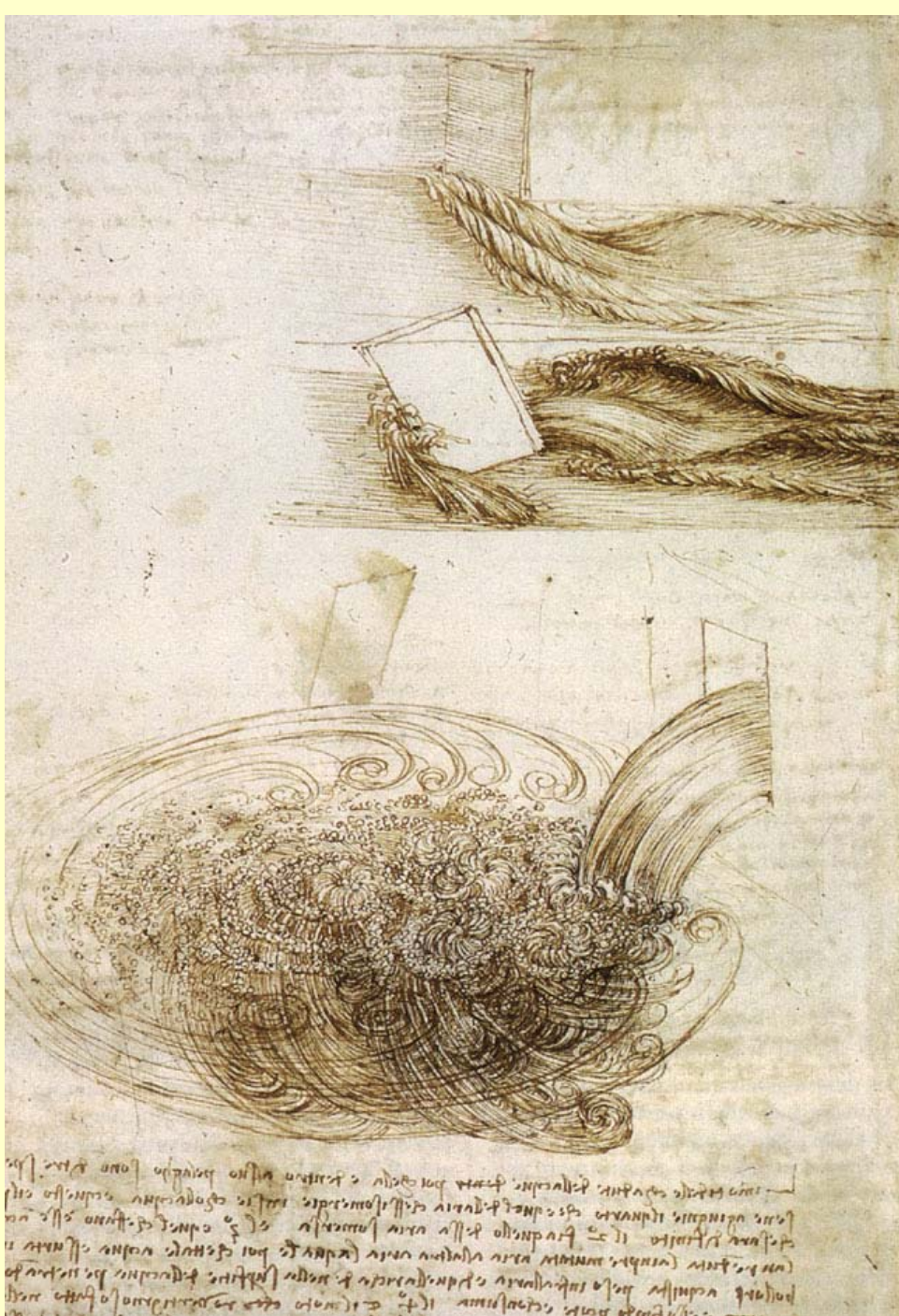
Mummification  
Ca 2500 BC



Egyptian Pyramid building



Vitruvian Man  
Leonardo Da Vinci  
(1471-1528)



Studies of Water passing  
Obstacles and falling,  
Da Vinci c. 1508-9



Design for a Flying Machine  
Da Vinci c. 1505





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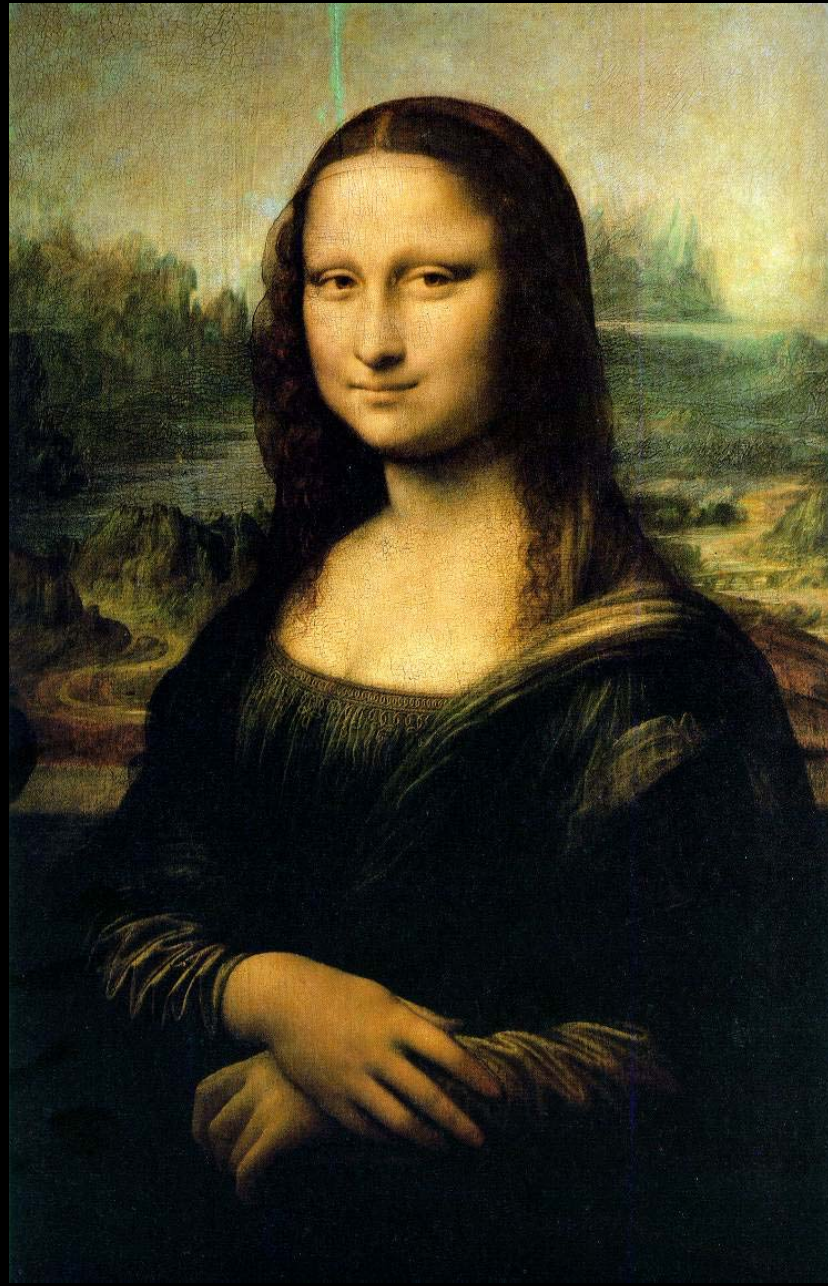
Ancient Connections  
Egypt  
Renaissance

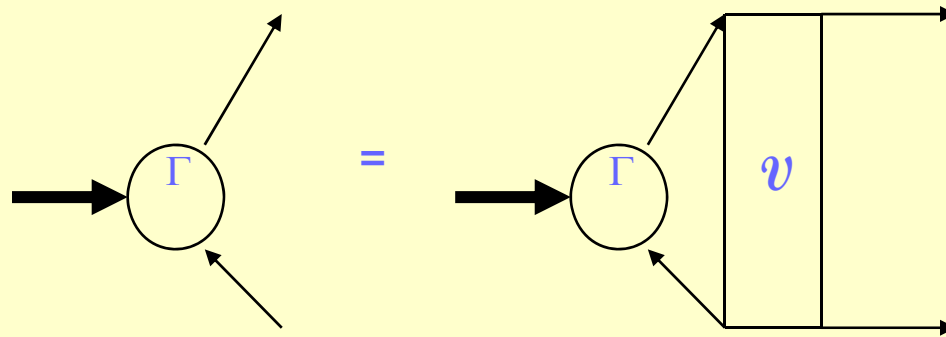
**“Beauty”**

Modern Connections  
Photography  
Fractals  
Simulations

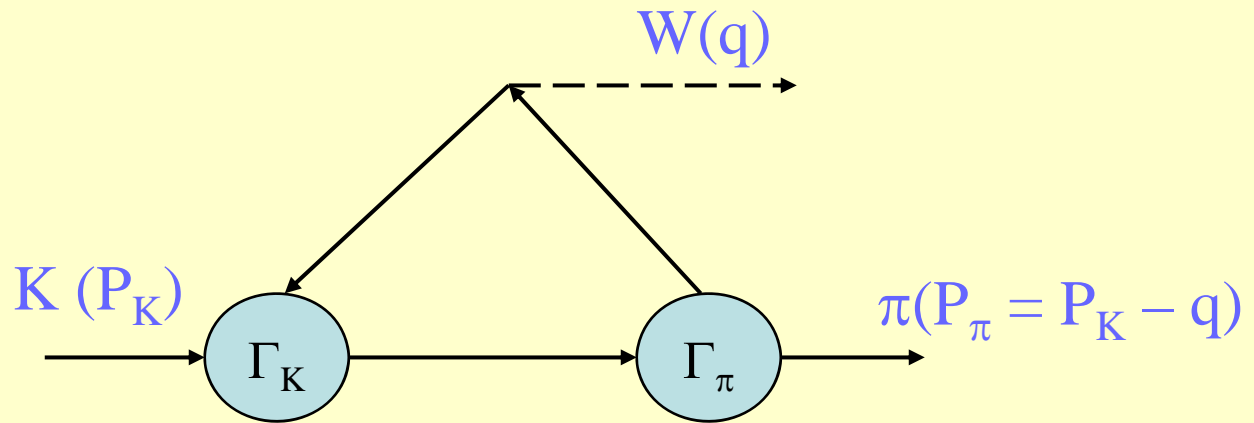
My work







$\mathbf{J}_\mu =$



$$J^\mu = (G_F / \sqrt{2}) V_{us} [ f_+(q^2)(P_K + P_\pi)^\mu + f_-(q^2)(P_K - P_\pi)^\mu ]$$



prototype seven-cell superconducting accelerating cavity



LHC



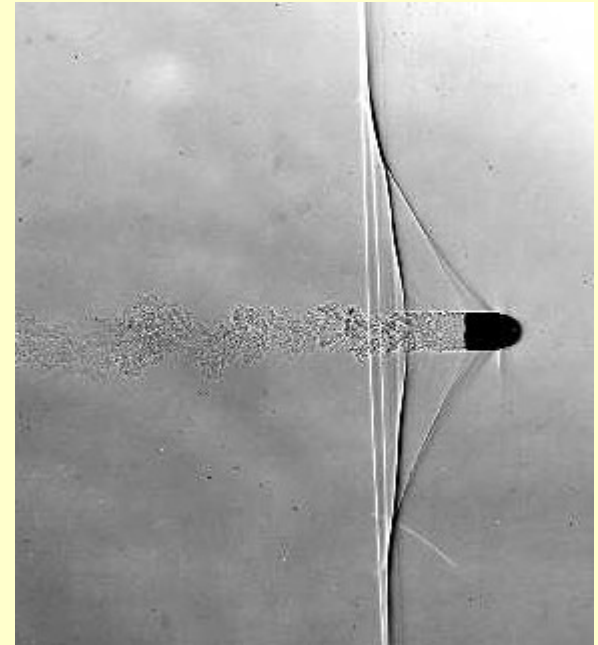
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Shadowgraph (**Schlieren photography**) of a .22-caliber bullet in flight  
Taken by an MIT freshman in 1962, in Edgerton's lab.  
The flash was triggered by the shock wave (shown) hitting a microphone (out of frame). The picture shows no solid object except the bullet.





Stroboscope photography

## Art Mirrors Physics Mirrors Art

Einstein, Picasso: Space, Time, and the Beauty That Causes Havoc

Arthur I. Miller

*Basic Books (Perseus), New York, 2001.*

*\$30.00 (357 pp.). ISBN 0-465-01859-X*

*2001 Physics Today Review*



**Les Demoiselles d'Avignon:**  
Picasso's 1907 excursion into  
a fourth dimension.

## ICTP News

13/6/2006

### Science Cafe on Physics and Art

Filed under:

Scientific Events

— editor @ 9:09 am

“Science is art” is the title of the Science Café that will be held today, 13 June, at 6 pm, at Caffè San Marco (via Cesare Battisti 18, Trieste). Claudio Tuniz, ICTP Assistant Director, and Gianrossano Giannini, professor of physics at the University of Trieste, will discuss how physicists and archeologists are now working together to improve our understanding of the past, and to solve many historical mysteries. Music and readings will enrich the event.

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Jérôme Basserode's huge spinning tops are some examples of Signatures of the Invisible, a joint project by CERN and the London Institute, the world's largest college of art and design.

Feb 2002





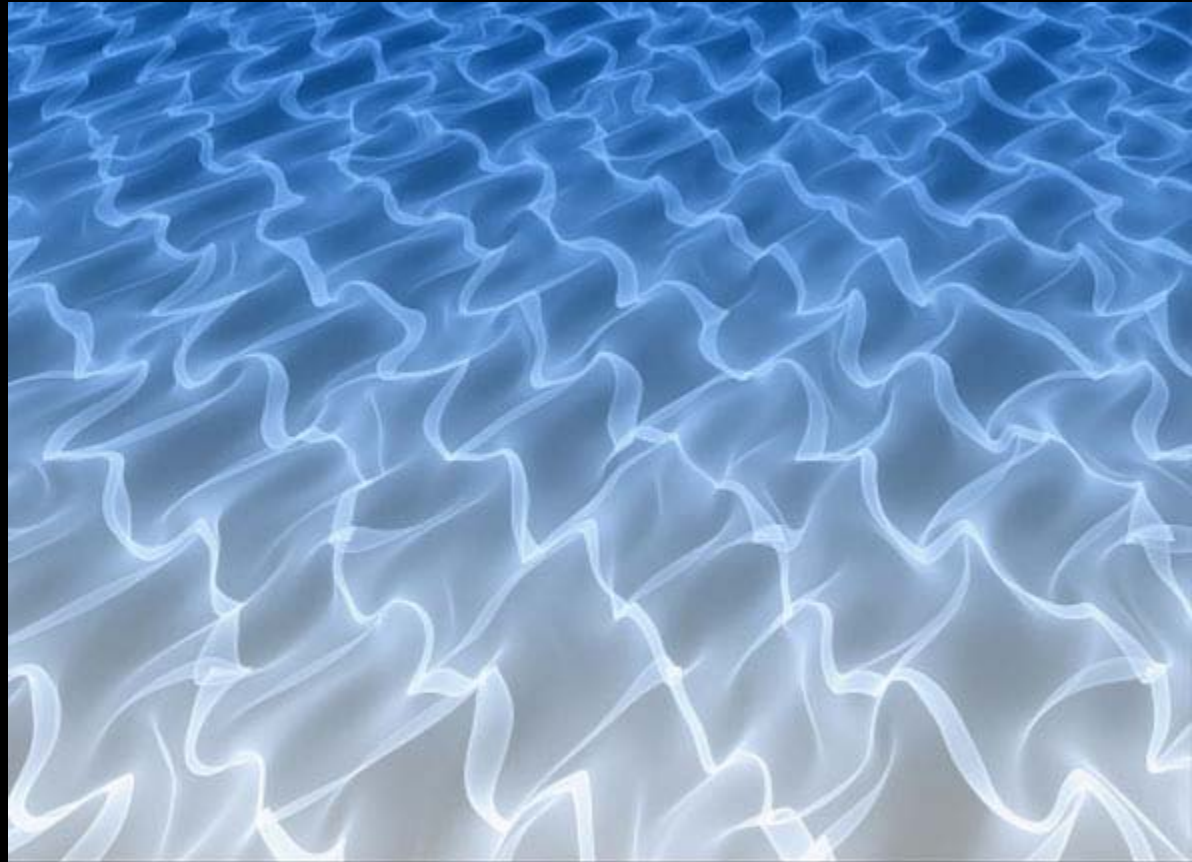
Not quite  $L = 1$  orbital outside Physics-Astronomy Building  
University of Washington, Seattle



Hubble's view of  
The Orion Nebula

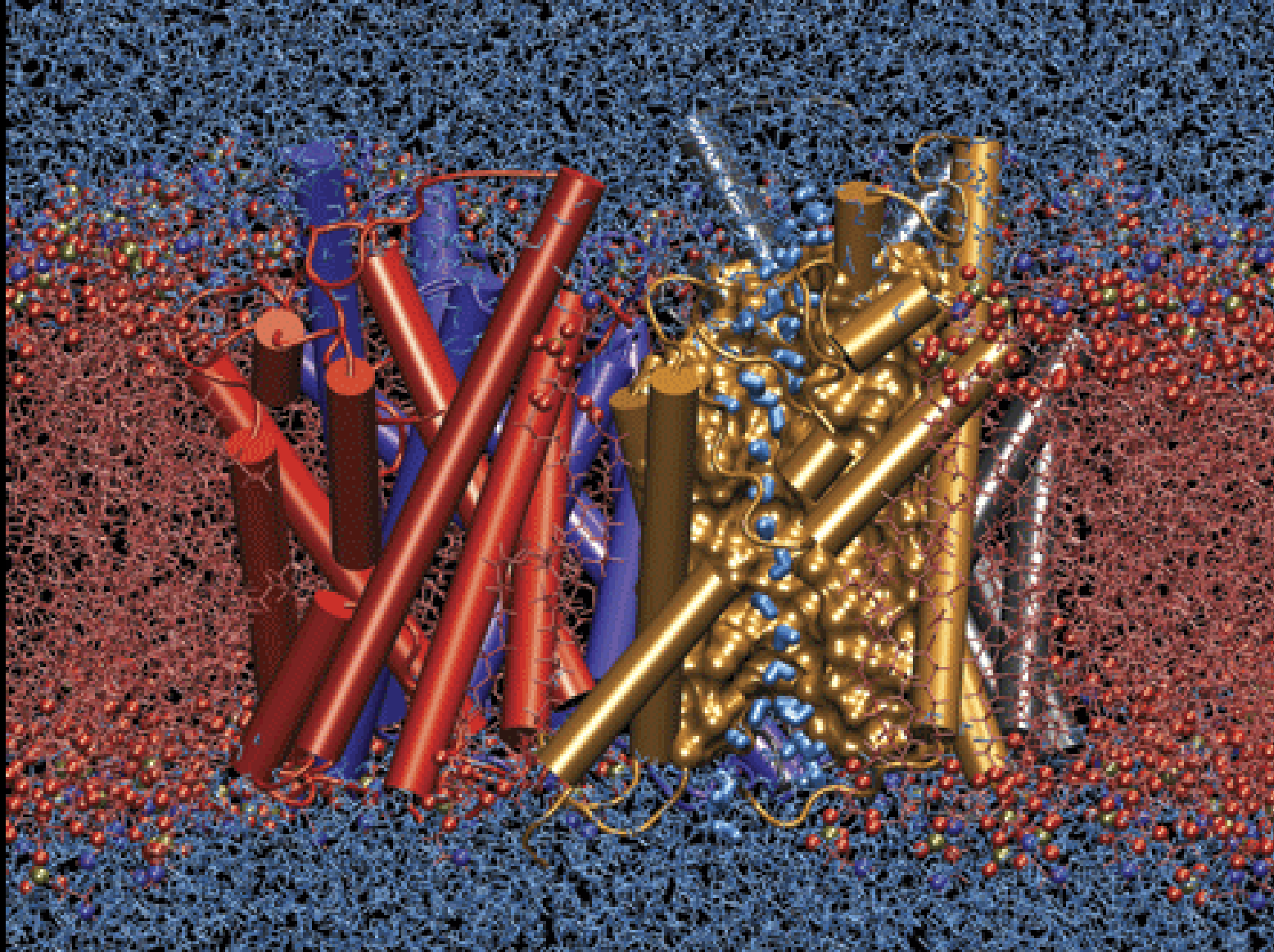


Sea shell based on logarithmic spiral – created with fractals by Clifford Pickover



Caustic I by Eric Heller





Winner 2004 Visualization Challenge

Water Permeation Through Aquaporins  
Emad Tajkhorshid and Klaus Schulten,  
Theoretical and Computational Biophysics Group,  
University of Illinois, Urbana-Champaign

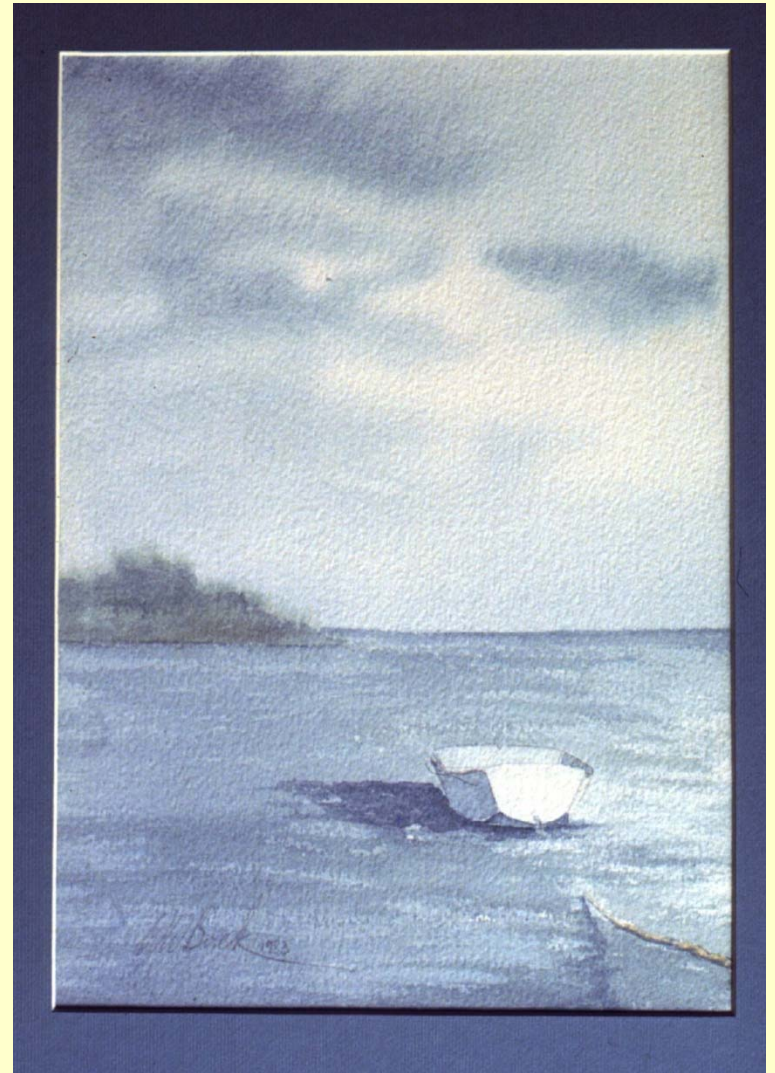
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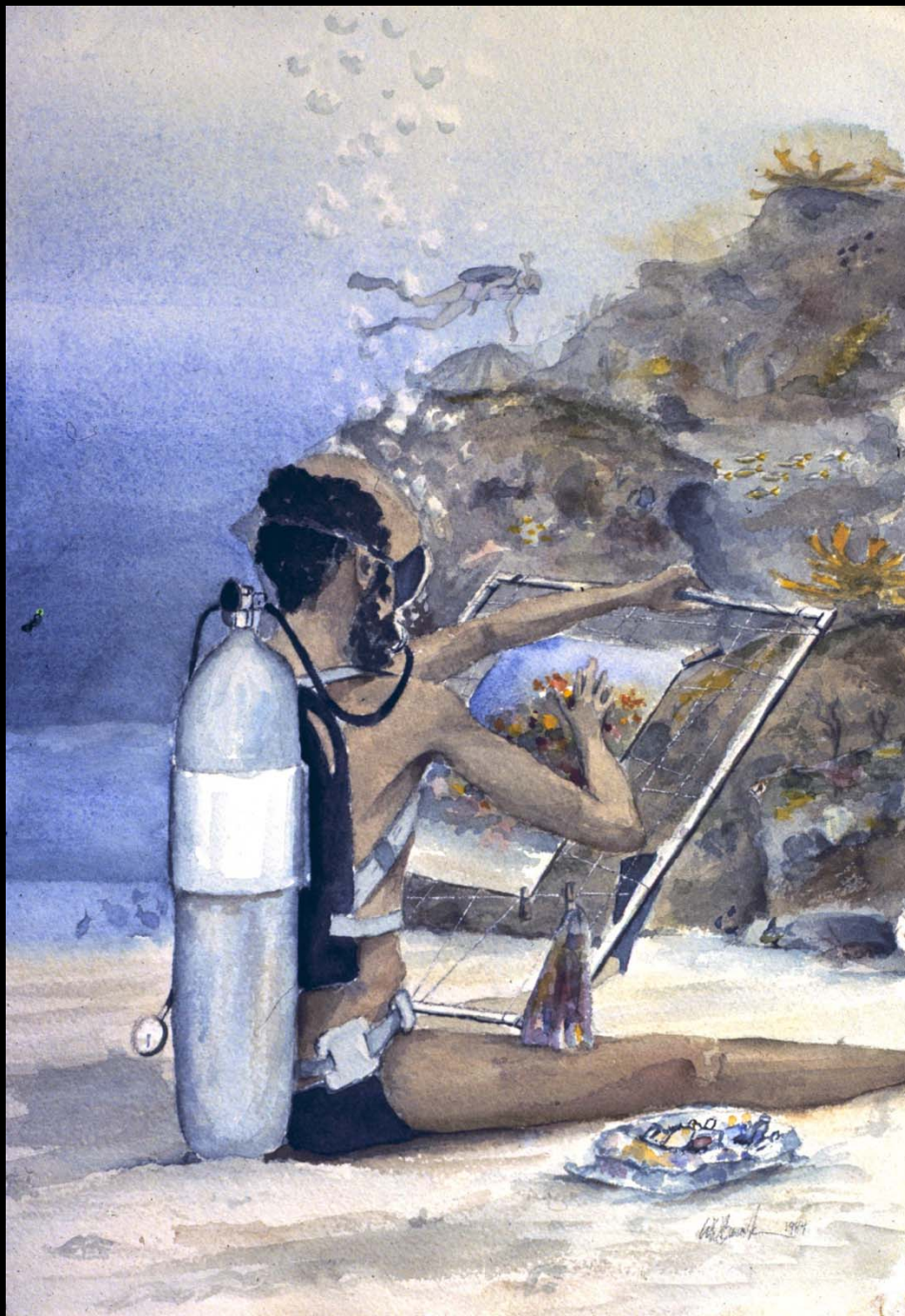
**My work**



(watercolor and pencil)



(watercolor and pencil)



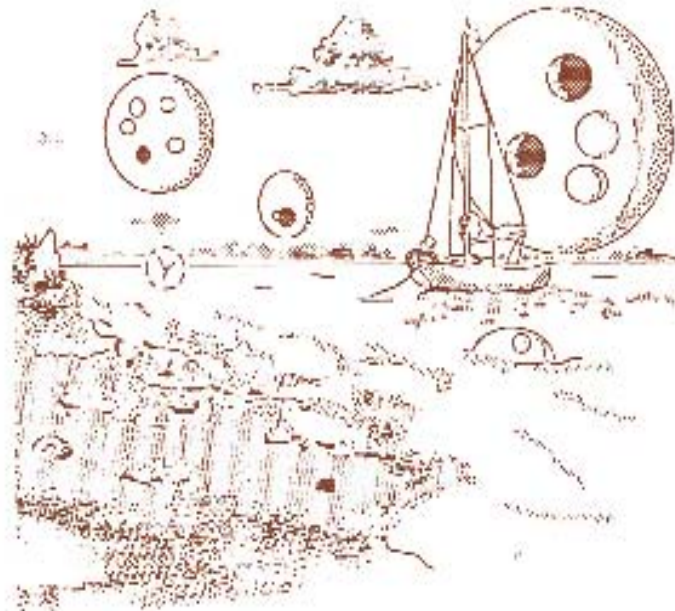
Self Portrait –  
Developing Underwater Painting  
On the ocean floor in the Bahamas  
1981-83

Painted in watercolor above sea level

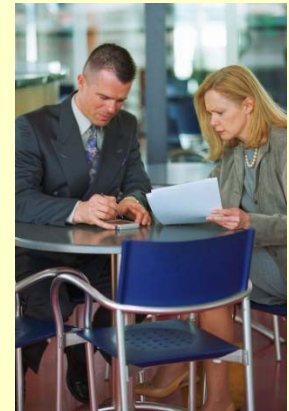


FIFTH ANNUAL  
**HUGS AT CEBAF**

MAY 29 - JUNE 16, 1990

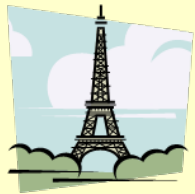




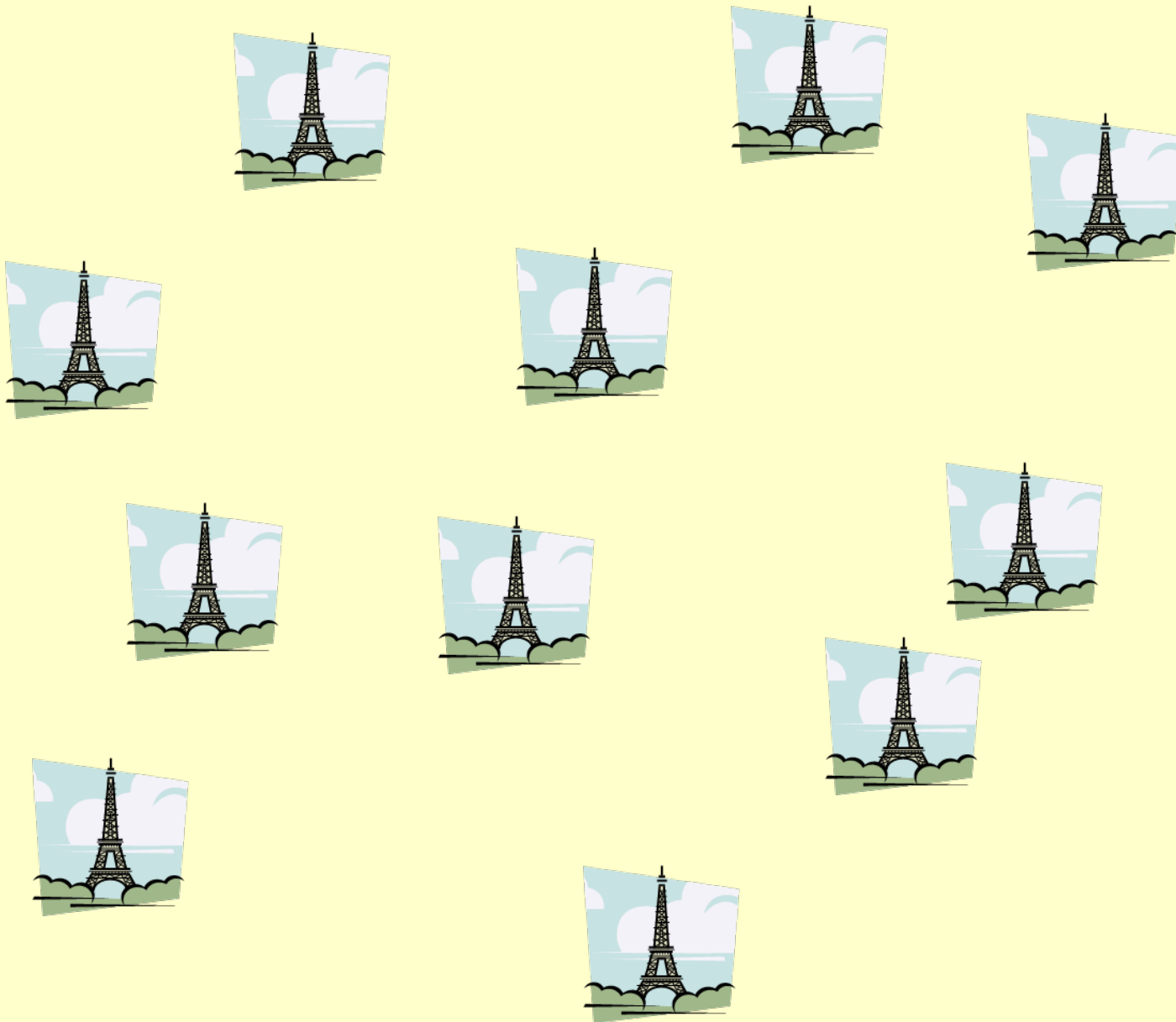


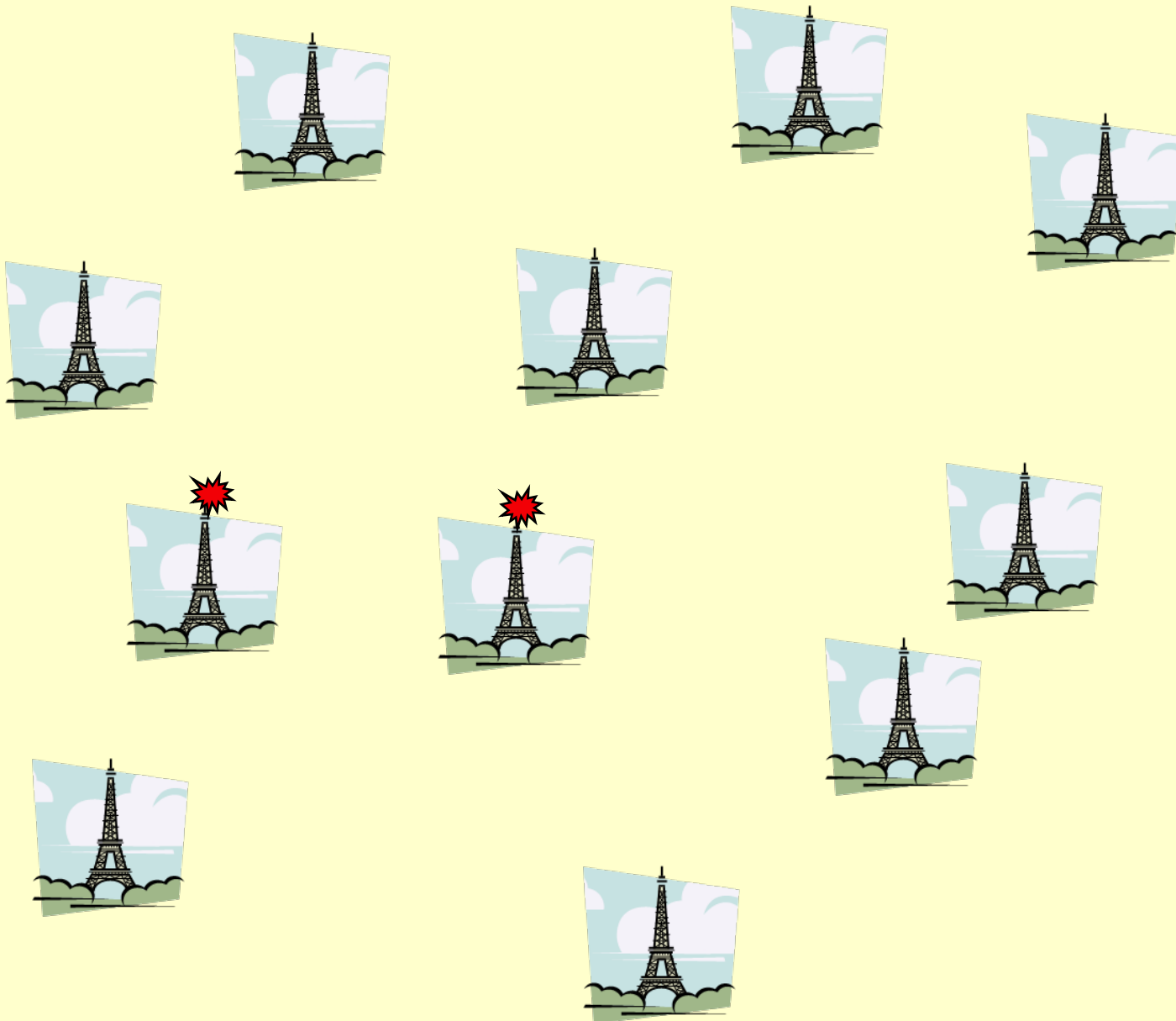


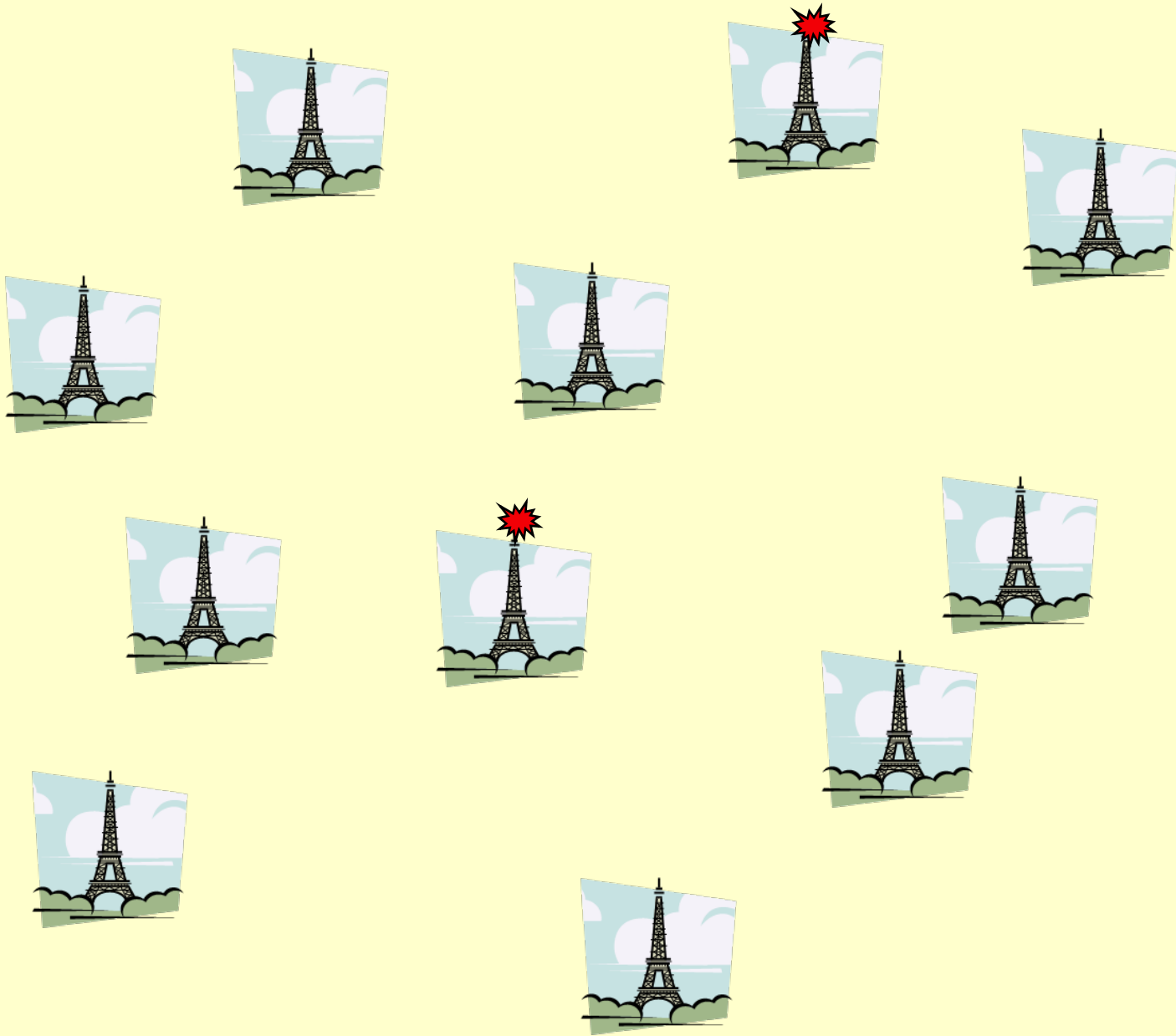


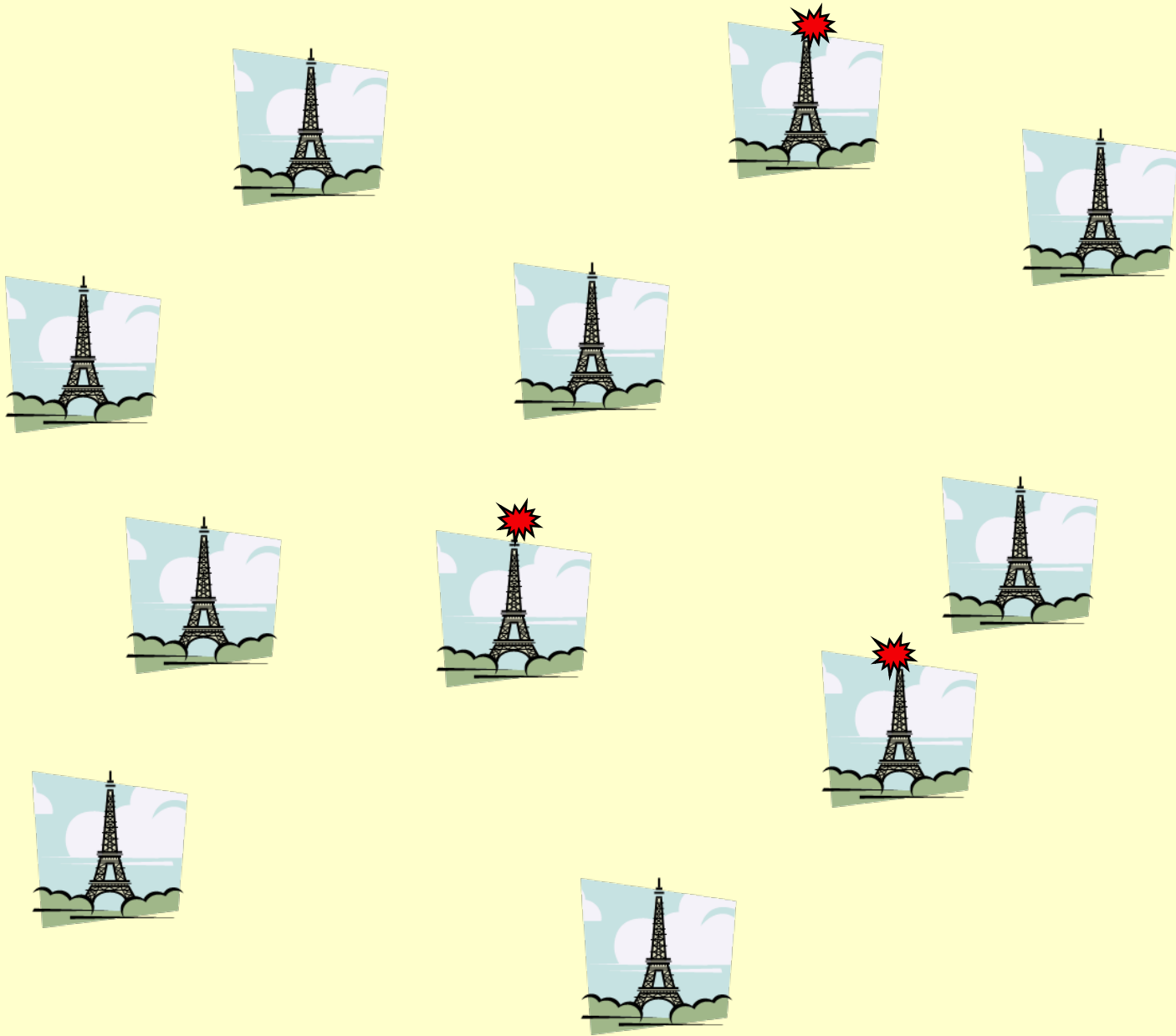


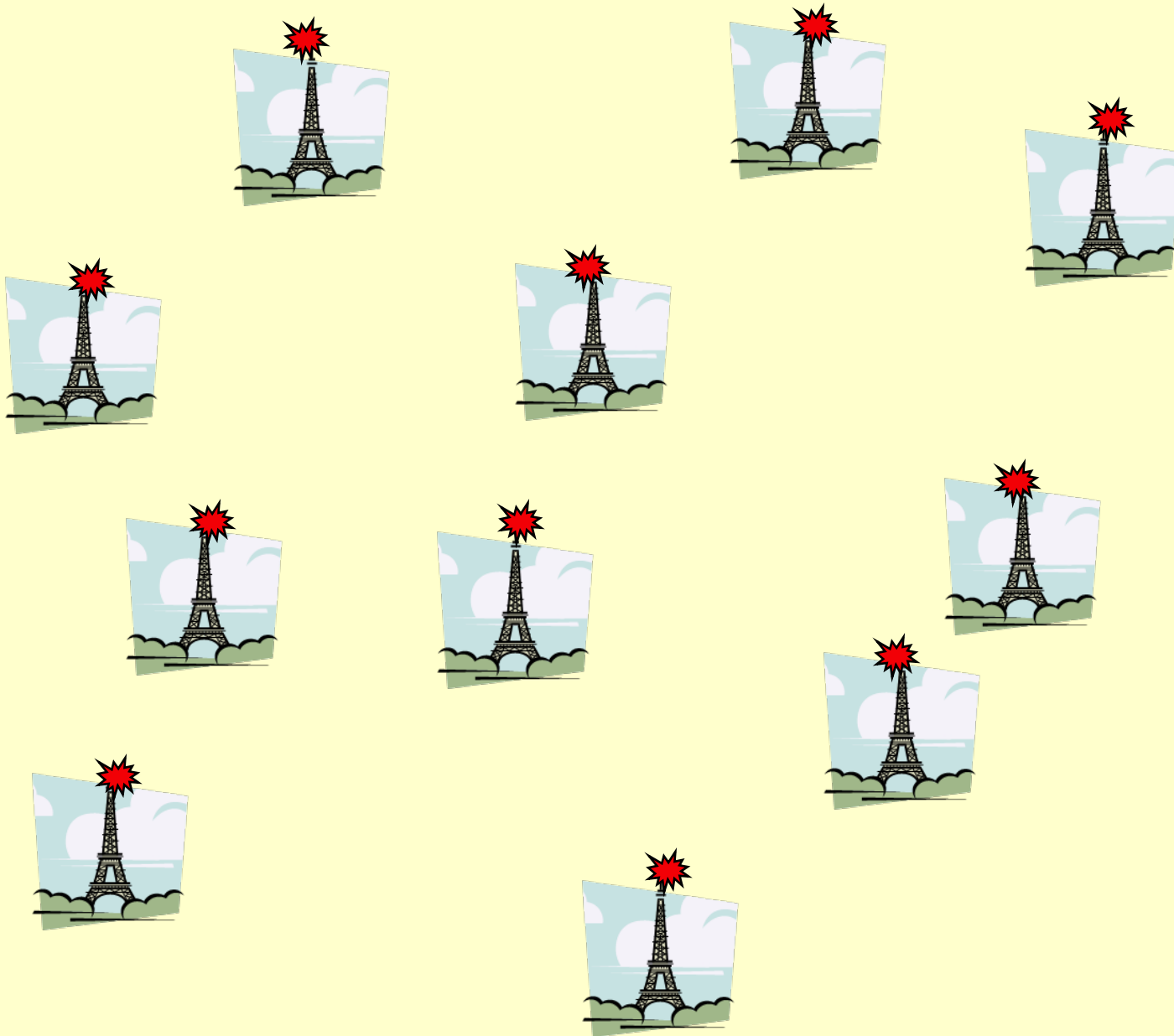






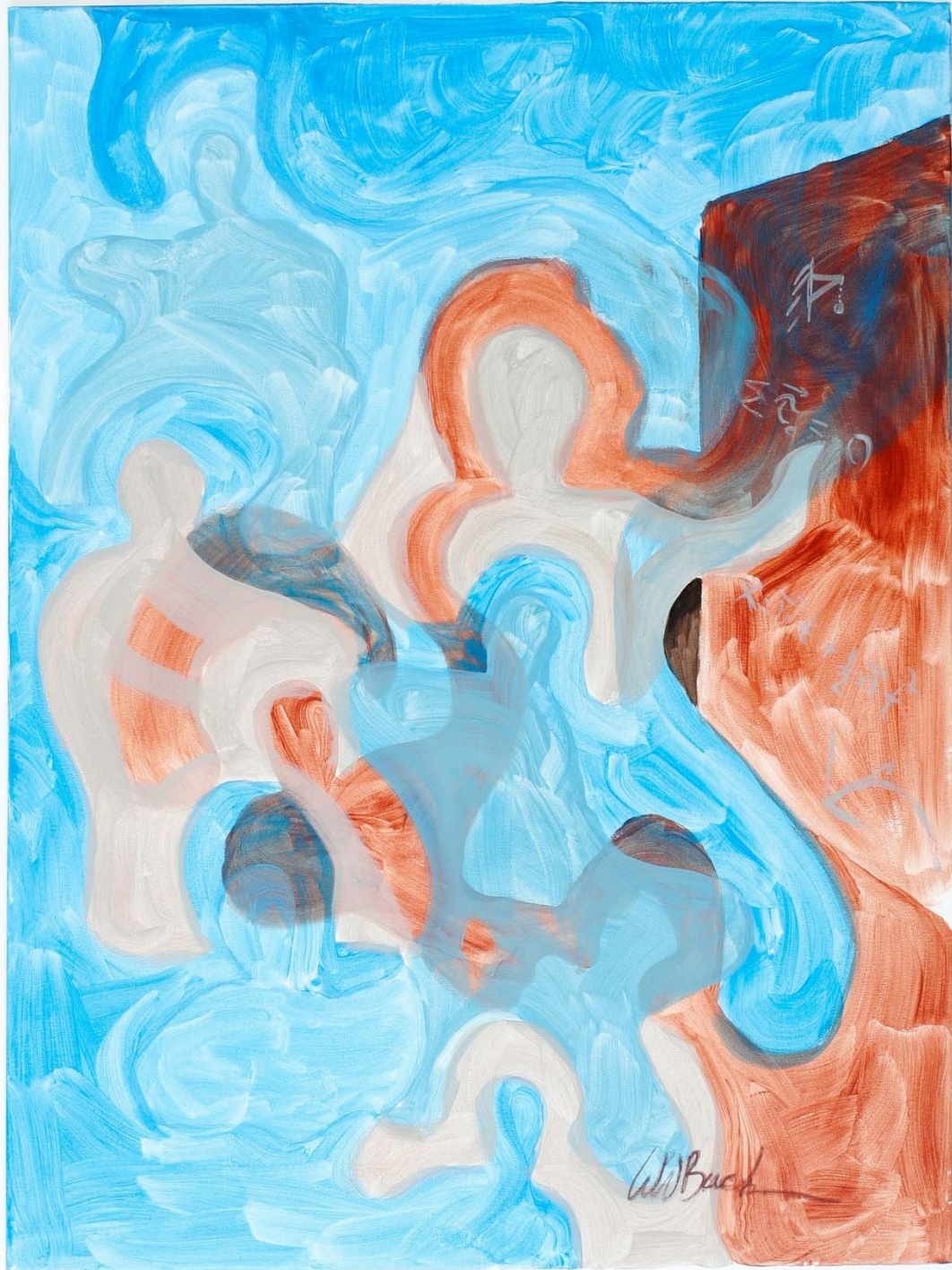


















W. B.





# *Next Steps*

Seek collaborators\*

Develop theoretical/phenomenological modeling calculations

Create digitized simulations from calculations

Learn and continue to produce  $\Omega$ mega art.

\* [wbuck@uwb.edu](mailto:wbuck@uwb.edu) and [www.warrenbuck.com](http://www.warrenbuck.com)



# *Yet Another Perspective*

One could pursue modeling how we  
*inhale* and *breath*  
each others' ...air

**What a concept?!**

\*cough\*

[wbuck@uwb.edu](mailto:wbuck@uwb.edu) and [www.warrenbuck.com](http://www.warrenbuck.com)

*Thank you very much!*



**Now for discussion and  $\Omega$ mega slide show**