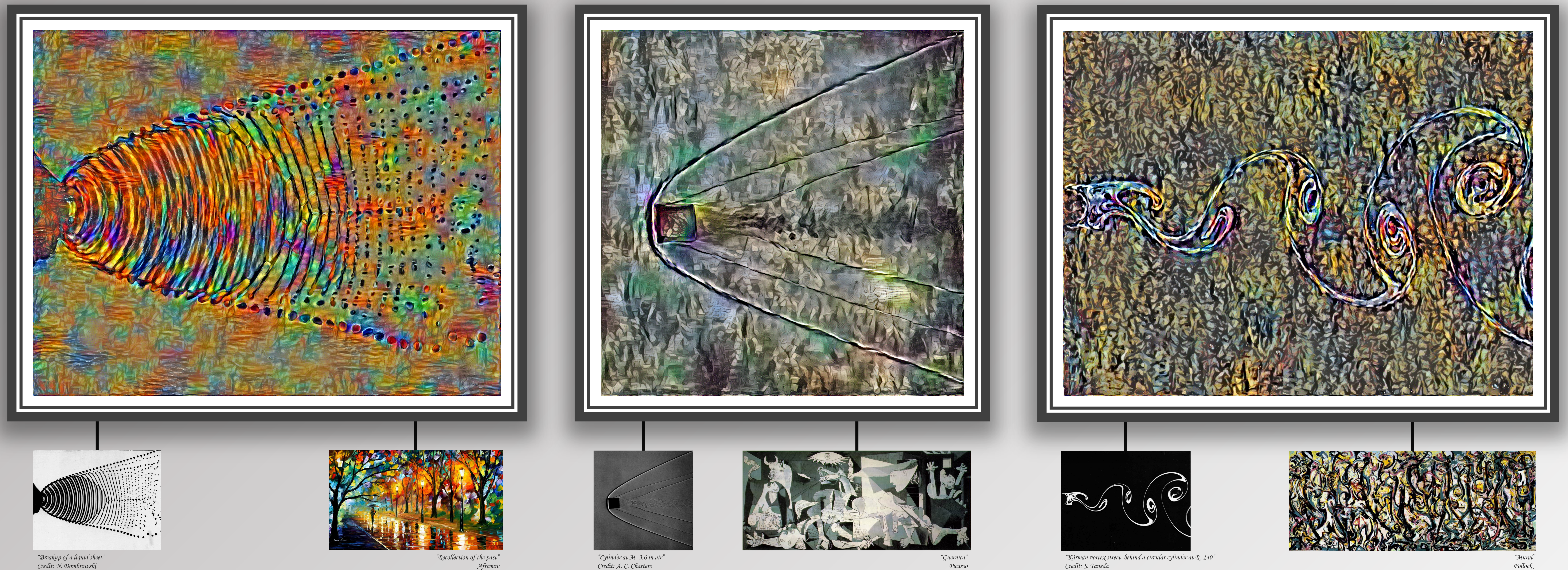


# Painting Fluid Motion using Convolutional Neural Networks

## An Album of Fluid Motion 2.0

Assembled by Maxime Bassenne, Andrew Banko and Sadaf Sobhani  
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"Breakup of a liquid sheet"  
Credit: N. Dombrowski

"Recollection of the past"  
Afremer

"Cylinder at  $M=3.6$  in air"  
Credit: A. C. Charters

"Guernica"  
Picasso

"Kármán vortex street behind a circular cylinder at  $R=140$ "  
Credit: S. Tanieda

"Mural"  
Pollock

**"Imagine that Van Gogh, instead of looking to the night-sky outside of his window at the Saint-Paul asylum, was able to look at other parts of nature for inspiration, such as a shock wave or flow instability."**

Art is generally characterized by its ability to communicate emotion and by its mimesis, or representation of reality. The methods of some art forms can also be used in science for the sake of representing nature, specifically in forms that enable scientific insights.

Photography is arguably the most common art form used in **Fluid Mechanics** research. Over the years, many photography techniques have been utilized to depict flow phenomena that the human eye alone cannot fully comprehend.

Now, with the help of **Artificial Intelligence**, these prints are transformed to reach their full artistic potential, opening new avenues for insights and inspiration. A convolutional neural network is used to *paint* a picture that combines the *content* of one image with the *style* of another. This gallery illustrates the technique with pictures from *An Album of Fluid Motion* (Van Dyke 1982) in the style of five classic paintings:



"Atomization from a nozzle"  
Credit: E. Klein

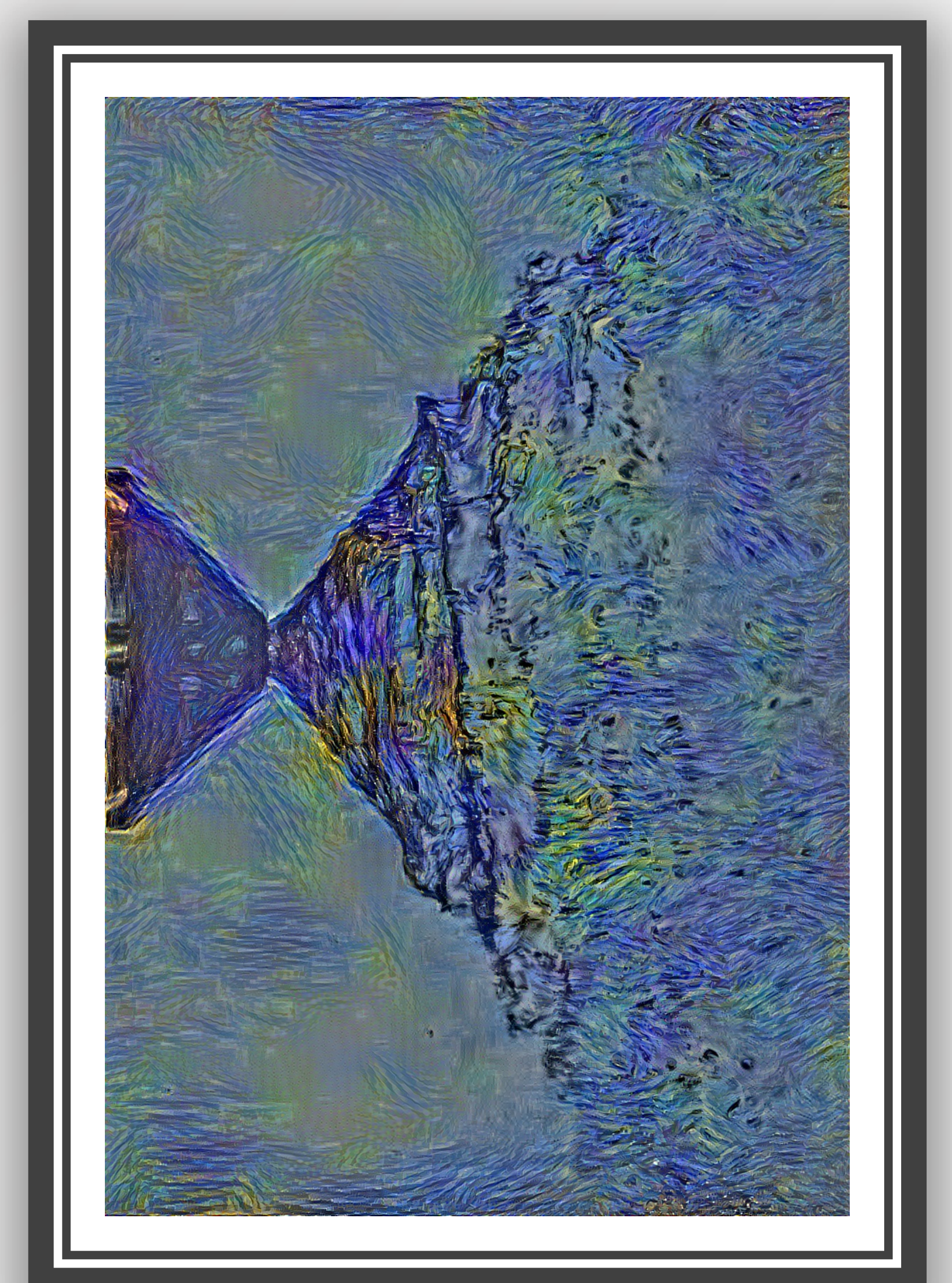
"Luxe, Calme et Volupté"  
Matisse



Content image

Style image

AI algorithm [1,2]



"Atomization from a nozzle"  
Credit: E. Klein

"The Starry Night"  
Van Gogh

**"By combining the content of a scientific image with the style of a timeless masterpiece, we can get a glimpse into the artist's expression of classical fluid mechanics phenomena."**