

## Felice Frankel

*Images in science are finally gaining the respect and attention they deserve as powerful tools for communication and for advancing scientific thinking. In creating a new department for American Scientist, I intend to look at visual representations of scientific data and ideas through photography, drawing, digital imaging, modeling and other means of visualizing concepts. Some will be historical, others new. Future issues will look at the work of highly accomplished scientists and visual communicators, including questions and answers to further our understanding of technique. Sightings debuts with an image I made some time ago.*

*I ask the reader to read beyond your original response to an image, as you would read between the lines of an article. Consider these pictures not only as documentation but as visual seeds, inspiring ideas. Judge them by the standards you insist upon in your work.*

In the image at left, hydrophobic lines micromachined into a hydrophilic self-assembled monolayer separate 4-millimeter-square drops of water colored with blue and green fluorescent dyes. The research underlying this image led to the development of soft lithography, which allows nanometer-scale patterns to be etched on curved surfaces for the creation of complex micro-electromechanical devices.

When my colleagues and I submitted this image to *Science*, where it appeared as the cover image on September 4, 1992 (accompanying Abbott, N. L., J. P. Folkers and G. M. Whitesides, *Science* 257:1380—1382) the editors believed that it appeared ambiguous because of the blue-purple tones in the water drops at the bottom of the photograph. As the accompanying article explained, the drops are pinned at their edges by the tiny surface features and do not communicate. I had mistakenly held the bouncing card (see caption) in a way that created an irregular reflection from the surface of the colored water. Luckily, in this first experience submitting a photograph to a science journal, I became aware of the importance of clarity when making images in science.



Combining ultraviolet and tungsten lights gave more uniformity to the fluorescing dyes in the water squares, creating the image that was eventually published.

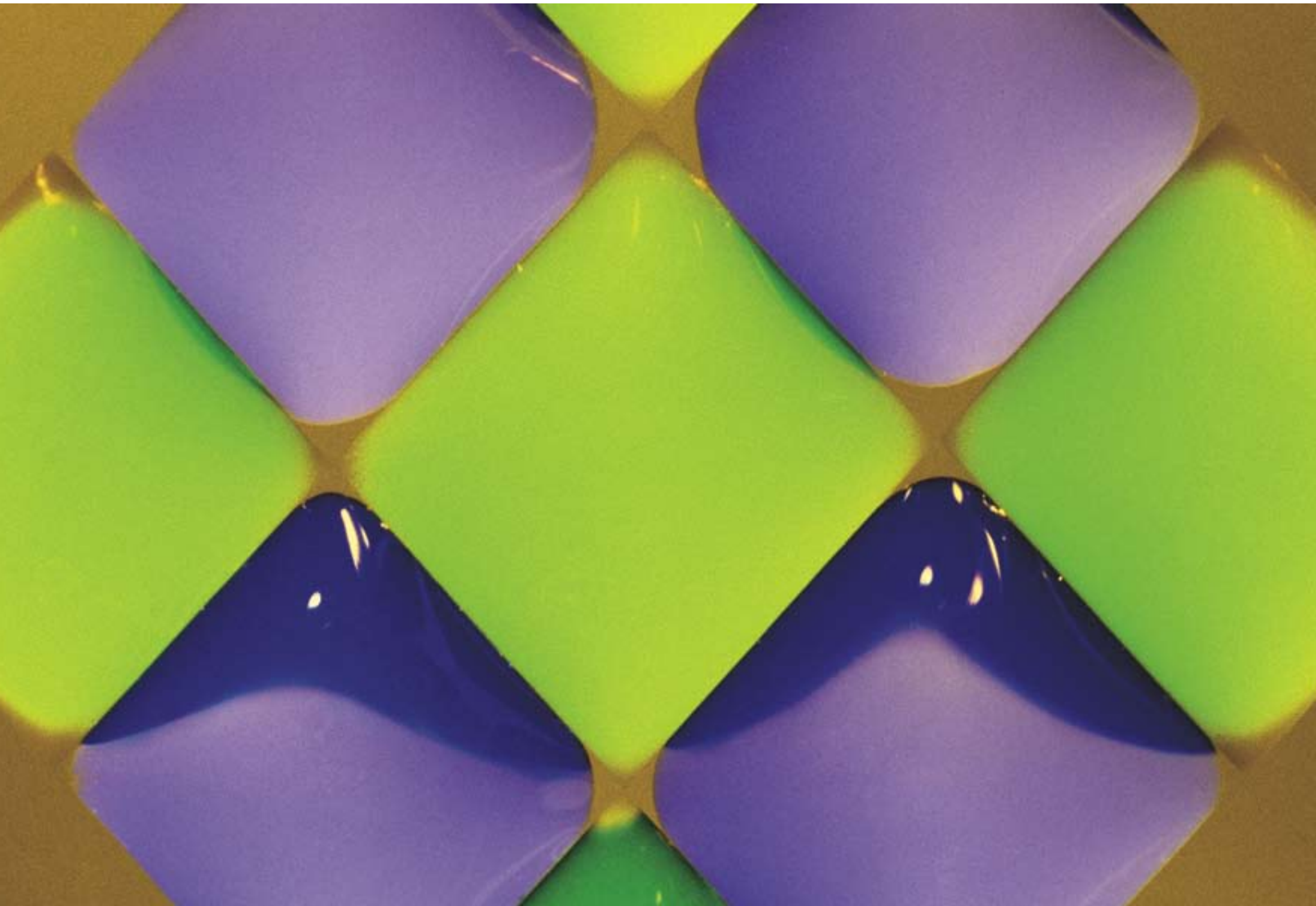


Image of square water droplets was created using a 105-millimeter macro lens and a Nikon F3 camera stabilized with a tripod. The light source was bounced from a gold card onto the sample's surface. (Photograph by Felice Frankel, from *Envisioning Science*.)

Felice Frankel is a science photographer and research scientist at the Massachusetts Institute of Technology. She is the author of *Envisioning Science: The Design and Craft of the Science Image*, published by the MIT Press in 2002. Address: c/o American Scientist, P. O. Box 13975, 99 Alexander Drive, Research Triangle Park, NC 27709-3975. Internet: felicef@mit.edu

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