

## The Art in Science of MicroTAS 2019

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The 2019 MicroTAS conference (the 23<sup>rd</sup> International Conference of Miniaturized Systems for Chemistry and Life Sciences) held in Basel, Switzerland, brought great opportunities to view inspiring microscale compositions. Many of the best images were highlighted at the annual Art in Science competition, sponsored by *Lab on a Chip* and the National Institute of Standards and Technology. This year's competition featured 39 entries, many worthy of recognition beyond our typical "top 3." Thus, we chose 3 runner ups and highlighted an additional 6 images as "top 10" honorable mention on display throughout the conference.

The committee thanks the contributors for invigorating the MicroTAS conference with their inspiring pieces—it was such a pleasure to consider these works of art and science.

Microfluidics and microscale research offer unique opportunities to view and express scientific discovery and creation beyond the scale of unaided human vision. This year's entries, like those from previous competitions, continue to serve that creative endeavor. We highlight many examples that enable us to encounter the hidden aesthetic of nature, to show novel creations from raw materials using new technologies, and to explore functional patterns that emerge when responsive biological components interact with a controlled environment.

We are very pleased to recognize the image "A Cell's World" by Joseph de Rutte from UCLA as the winner of the 2019 Art in Science Award (Fig. 1). The photomicrograph is a wonderful combination of color and shape that the author created from "uniform droplets formed using structured microparticles" that were "used to encapsulate single-cells and measure their secretions." The basic characteristics and composition of the fabricated droplets are brilliantly depicted in the image, which inspires their use as both surrogates and vessels for cells. The award was presented at the RSC booth during a special ceremony (Fig. 2).

First runner up was awarded to Laura Barillas, Leibniz Institute for Plasma Science and Technology (INP), Germany, for the image "MicroQuasar (Fig. 3)." We thought the author's caption perfectly highlighted the similarity, despite the incredible difference in length scales, between the spiral plasma image and the radiation that one might visualize exiting a quasar.

Michael Restaino from the University of Maryland, USA, earned second runner up for "Sensing in Three-Dimensions," for his extraordinary demonstration of the complex structures that can now be achieved with 3D printing technology (Fig. 4). The well-composed and colored image shows interwoven metallic and fluidic structures.

Finally, the third runner-up honor was presented to Charlotte Yvanoff from Vrije Universiteit Brussel, Belgium, for the composition "Stars and Diamonds made out of bone cells (Fig. 5)." The image highlights

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the functional forms that are adapted by cells following interaction with a well-defined physical environment that limits sites for cell-substrate attachment. Such platforms have proven incredibly powerful in understanding various aspects of cell survival and function.<sup>1</sup>

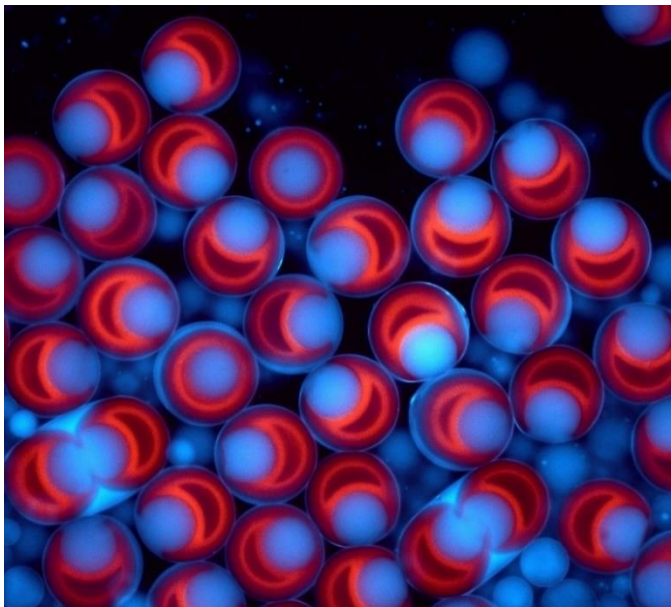
The selection committee for the award consisted of Jeanne Andres, *Lab on a Chip* Executive Editor, Greg Cooksey, Project leader in the Microsystems and Nanotechnology Division at NIST, and Hang Lu, *Lab on a Chip* Associate Editor and Professor of Chemical and Biomolecular Engineering at the Georgia Institute of Technology.

### Acknowledgements

The Art in Science competition is sponsored and supported by MicroTAS, the Chemical and Biological Microsystems Society (CBMS), the *Lab on a Chip* journal, and NIST. The 2019 award consisted of a monetary prize (\$500), an award certificate, and a coveted front cover of the *Lab on a Chip* journal. Please check the MicroTAS 2020 conference website for further details regarding changes to the competition format and image submission deadline for the next MicroTAS Conference.

### Reference

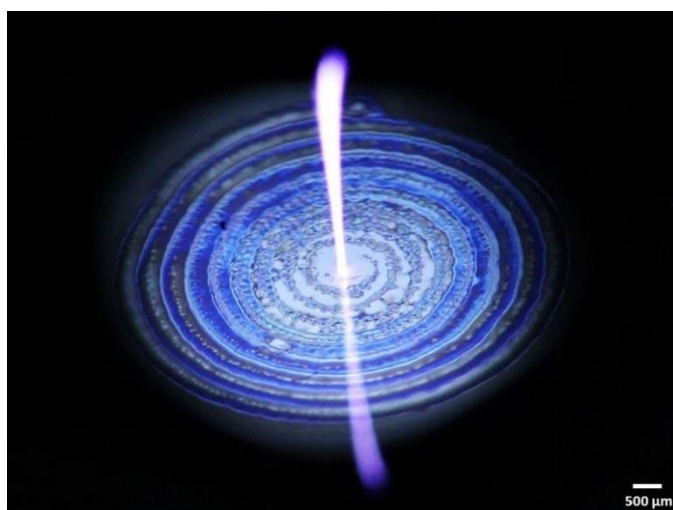
<sup>1</sup>C. S. Chen , M. Mrksich , S. Huang , G. M. Whitesides and D. E. Ingber , *Science*, 1997, **276** , 1425.



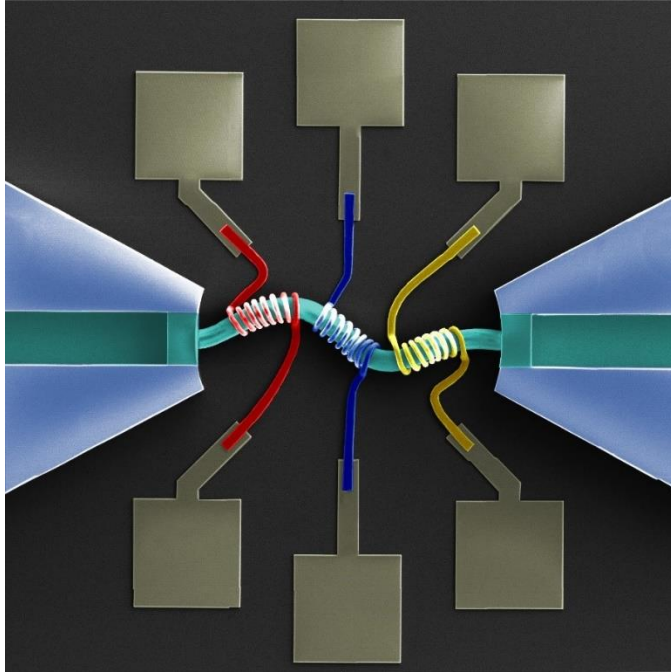
**Fig. 1** "A Cell's World" by Joseph de Rutte from the University of California, Los Angeles (UCLA), USA, was the winning image from the 2019 Art in Science Competition.



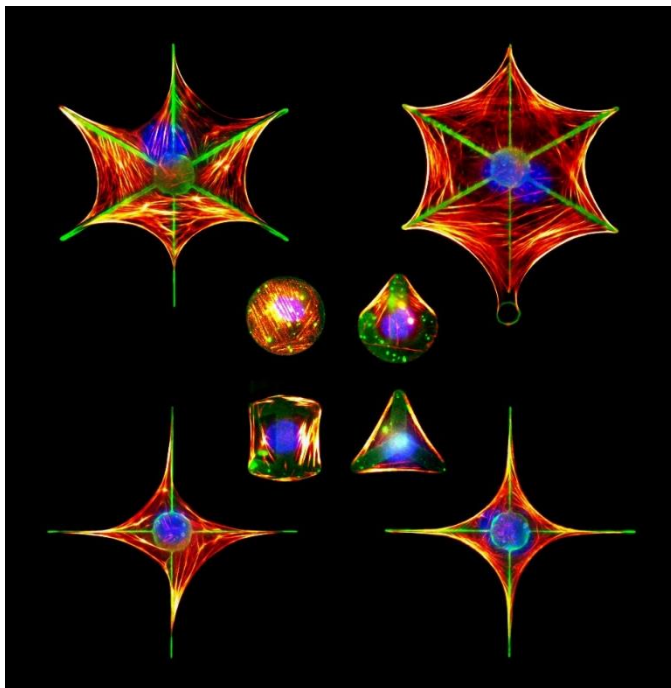
**Fig. 2** Greg Cooksey (left) and Maria Southall (*Lab on a Chip* Deputy Editor; right) present the Art in Science award to winner Joseph de Rutte at the RSC booth.



**Fig. 3** Laura Barillas from Leibniz Institute for Plasma Science and Technology (INP), Germany was honored with first runner up for her submission “MicroQuasar.” The author captured the spiral micropattern that developed during a maskless polymerization process.



**Fig. 4** “Sensing in Three-Dimensions” earned second runner up for Michael Restaino from the University of Maryland, USA. The scanning electron microscope (SEM) image provides intricate details of one of the most complicated 3D-printed devices ever realized on the microscale.



**Fig. 5** “Stars and Diamonds made out of bone cells” by Charlotte Yvanoff, Vrije Universiteit Brussel, Belgium. The fluorescent image shows how protein patterns (green) can direct the formation of actin stress fibres (red) and position of nuclei (blue) within cells attached to micropatterned substrates.