SCIGEM

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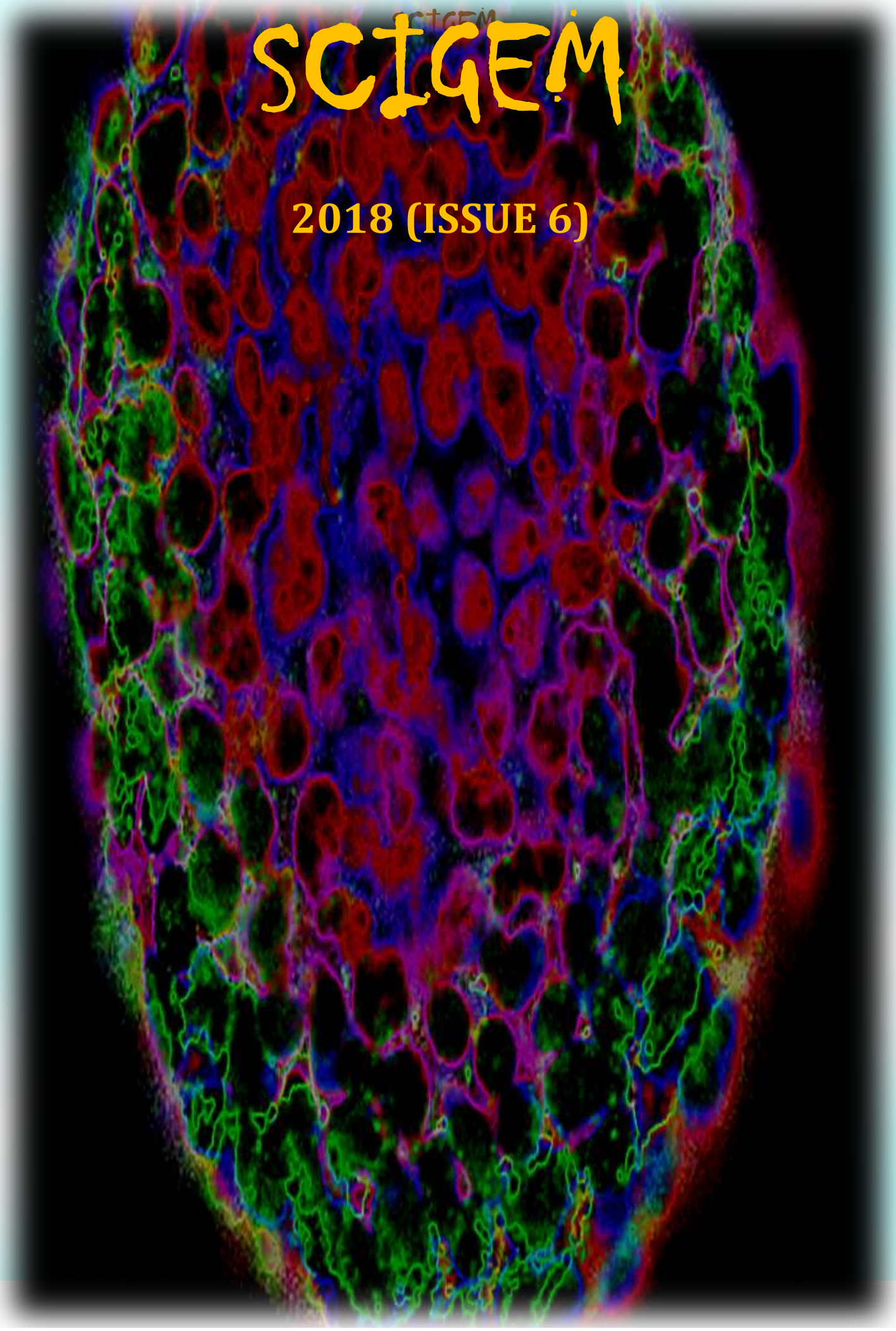
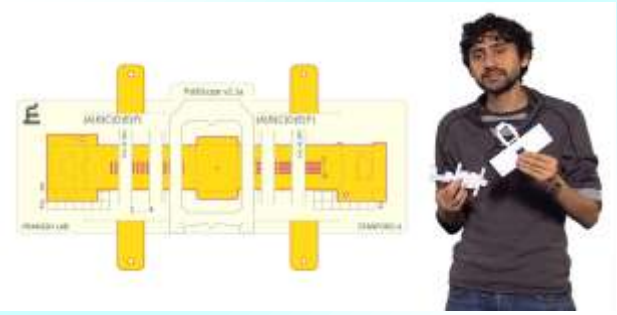
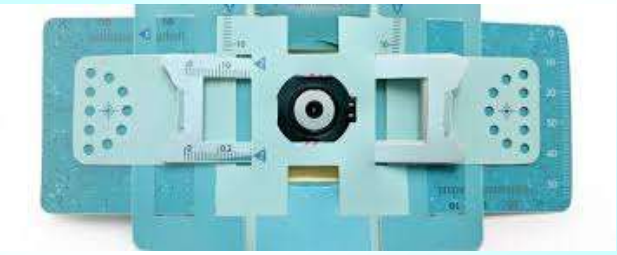


Foldscope Man



(Picture courtesy: Google image)

We know that science is knowledge and art is an expression. So art and science are inseparable because we use art to reveal a scientific fact and what exactly an Indian American scientist has done in this 21st century. There would be hardly someone who has not played with a paper aeroplane or a paper boat in their childhood. Making a shape by folding paper is called origami in Japanese. If you know about the origami then you may have the idea that how you can create a beautiful architecture from a single paper by mixing your imagination and skill. We all know that origami is an age-old art originated sometime in Japan, but we become shocked when a scientist uses his origami skill to transform a complex expensive microscope into a simple and cheap paper microscope. We become surprised when we see a toy like a paper microscope is almost similar powerful to observe a microbe as we see under a conventional microscope. Yes, you have got it correct; we are just talking about a modern biophysicist of repute in the contemporary world, Dr. Manu Prakash.



Manu Prakash is born and brought up in Meerut, Uttar Pradesh, India. He has pursued his B. Tech. in computer science from Indian Institute of Technology, Kanpur in 2002. Then he joined Ph.D. in Media Arts and Sciences at Massachusetts Institute of Technology, MA, USA. He has received his Ph.D. in 2008; now he is an Assistant professor of bioengineering at Stanford University, USA.

Dr. Prakash's lab is devoted to many innovative projects like the paper microscope, water computer etc. He is also engaged in the innovation of organismic biophysics, algorithmic self-assembly, soft matters etc. His students have developed a computer that operates by water droplets. It is started with a goal of designing a new class of computers that precisely control and manipulate physical matter. This water computer can perform any operation that a conventional electronic computer can perform although at a slower rate. Thus, this water droplet operated computers are universal in nature and the further progress may cut down the power use for computer operation as it may be a substitute for the conventional computers in many places. He recently discovered the remarkable physics of a lily pad beetle for pure scientific curiosity. He described the research as "just good old natural history," with a large dose of physics.

Dr. Prakash is best known for his pioneering work in inventing high-tech tools using inexpensive materials – an endeavor he calls 'frugal science'. His inventions may have been designed to address complicated problems, but their low cost and simple designs make them accessible to everyone. In his early carrier, Dr. Prakash had made spellbound the entire scientific community by developing a pocket-sized paper microscope which is made of plastic-impregnated paper. Later he has named it as "Foldscope" – a printable, use-and-throw microscope made almost entirely from a sheet of paper and is powerful enough to detect a malaria parasite in a drop of blood, yet costs just 50 cents.

The idea of this microscope emerges to his mind when he was doing his fieldwork in many developing African countries. He realizes the need for inexpensive tools for medical support to the poor and needy. He has also invented a centrifuge tool by transforming a toy spinner to an efficient paper centrifuge for detection of the malaria parasite in the blood of the village patient.

Dr. Prakash has also created a microfluidic reactor just by using different parts of a broken music box. This device can be programmed to mix precise amounts of chemical fluids in a way that is useful for both students and researchers. The design relies on metal pins that pass through punch card paper in order to release chemicals from individual channels. This prototype can be recreated anywhere and anytime by spending just $5.

Dr. Manu Prakash has been honoured and awarded with many national and international awards. MacArthur Fellowship, Popular Science Brilliant 10 in TR35, MIT Technology Review, Gates FoundaVon ExploraVons Award, India Abroad Face of the Future Award, Frederick E. Terman Fellow Stanford University, TED Senior Fellow, Technology, Entertainment and Design, Junior Fellow (Physics), Harvard Society of Fellows, MIT Ideas Sustainability Prize, MIT are the few recognition in his claim. His aim is to hand over a scientific tool in the hands of anyone with a question.

Picture courtesy:

[1] Google Image

Further Readings

1. MIT Technology Review
2. ACS Cent Sci. 2017 Mar 22; 3(3): 148–149
3. Other online blogs and News reports

SCIGEM Editorial Choice
[Scigem, **2018**, 5, 1-2]