

# Green Electronics to Gray Matter

**SPEAKER: Prof. Deblina Sarkar**

**TIME: 2019/05/14 [Tues.] 9:00-10:30 AM**

**LOCATION: Rohm Building, Room 10-206**



**ABSTRACT:** While the computing demands of Information Technology are ever increasing, the capabilities of electronics have hit fundamental walls due to energy and dimensional unscalability. In this talk, I will demonstrate the quantum mechanical transistor, that I developed [Nature 2015], which beats the fundamental energy limitations. This device is the world's thinnest channel (6 atoms thick) sub-thermal tunnel-transistor. Thus, it has the potential to allow dimensional scalability to beyond Silicon scaling era and thereby to address the long-standing issue of simultaneous dimensional and power scalability.

Going beyond electronic computation, I will discuss about the biological computer: the brain, which can be thought of as an ultimate example of low power computational system. I will introduce the technology [Soc. Neuroscience 2016], which reveals for the first time, a nanoscale trans-synaptic architecture in brain and the way mother nature has engineered biomolecular organization in the brain to optimize its computing efficiency.

I will conclude with my research vision for how extremely powerful technologies can be built by fusing diverse fields and discuss briefly about the research directions of my new lab at MIT.

**BIOGRAPHY:** Deblina Sarkar will start as an Assistant Professor at MIT in Fall 2019. Her work is at the interface of physics, nanoelectronics and biology. Her PhD dissertation was honored as one of the top 3 dissertations throughout USA and Canada in the field of Mathematics, Physical sciences and all departments of Engineering. She is the recipient of numerous other awards and recognitions, including the U.S. Presidential Fellowship (2008), Outstanding Doctoral Candidate Fellowship (2008), one of three researchers worldwide to win the prestigious IEEE EDS PhD Fellowship Award (2011), Falling Walls Lab Young Innovator's Award at San Diego (2015), "Materials Research Society's Graduate Student Award" (2015), named a "Rising Star" in Electrical Engineering and Computer Science (2015), Lancaster Award (2016), invited speaker at TEDx (2016), MIT Translational Fellowship (2017) and Technology Review's one of the Top 10 Innovators Under 35 from India (2018). She has also received the prestigious NIH K99/R00 Pathway to Independence Award.

Deblina's lab currently has open research positions in

- RF engineering and wireless sensing for biomedical and other applications
- Magnetoelastic and multiferroic devices

For more details on open positions, visit <https://deblina-sarkar.mit.edu/research-positions-available>

Open Research  
Positions at MIT:

