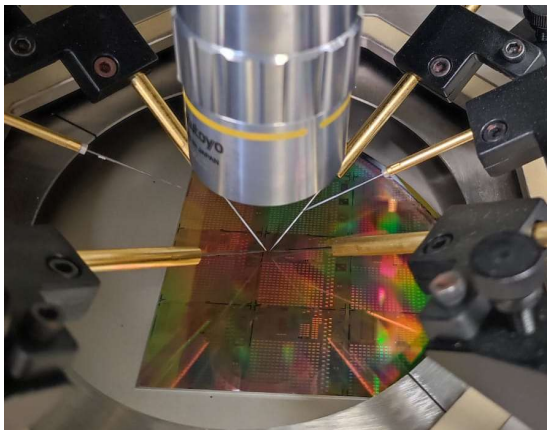
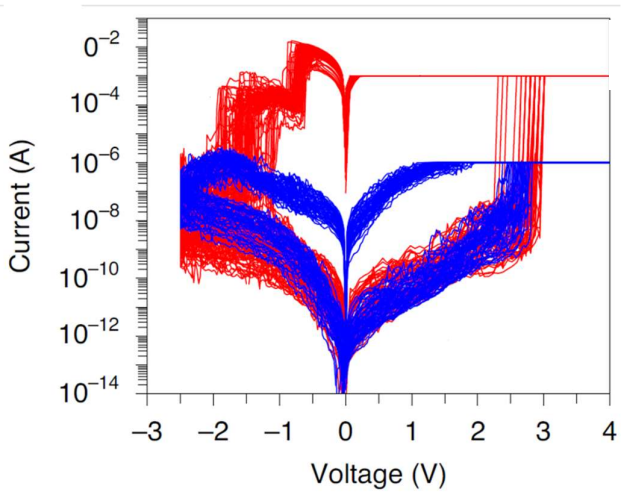
Available!!

ASIC² ARCHITECTURES SYSTEMS INTELLIGENT COMPUTING INTEGRATED CIRCUITS

Statistical Experimental Measurements of Memristive Device Variability

The exponential growth of data calls for increasing power efficiency in computation as well as scaling down the needed computation area. New emerging non-von Neumann technologies offer solutions to these challenges and are often based on memristive devices such as resistive RAM (ReRAM) and Y-flash as building blocks. Resistive RAM (ReRAM) and Y-flash are great candidates for neuromorphic applications. The feasibility of the devices has to be evaluated by experimental characterization of the technologies using statistical measurements. By that, the variability (i.e. the variation of the measurement results between different cycles and different cells) can be determined, which is crucial for the accuracy of the application.





[1]

Project goals:
This project aims to statistically evaluate the variability of ReRAM by Weebit and Y-Flash devices fabricated in Tower 180 nm standard CMOS process. The devices will be measured and characterized to generate statistical information of device variability and reliability.

What the students will do:

- Hands-on electrical measurements with lab equipment
- Investigate device characteristics of memristors
- Learn about theoretical background and application of memristors
- Use statistical analysis tools, get familiar with different evaluation methods

Recommended:
Python

For more information:
henriette.p@campus.technion.ac.il (Henriette Padberg)

Reference:
[1] S. Chen, "Wafer-scale integration of two-dimensional materials in high-density memristive crossbar arrays for artificial neural networks", *Nature electronics*, **2020**