Let's Create an Open-Source MOSbius
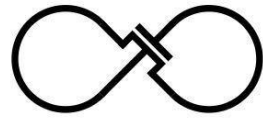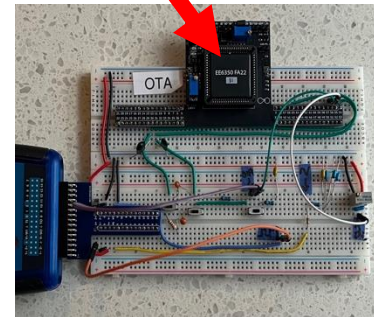
Peter Kinget

Analog & RF **IC** **D**esign **R**esearch
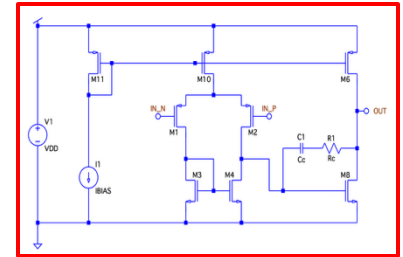
Columbia Integrated Systems Laboratory

http://www.cisl.columbia.edu

MOSbius Track

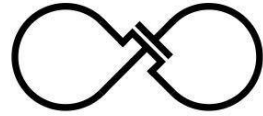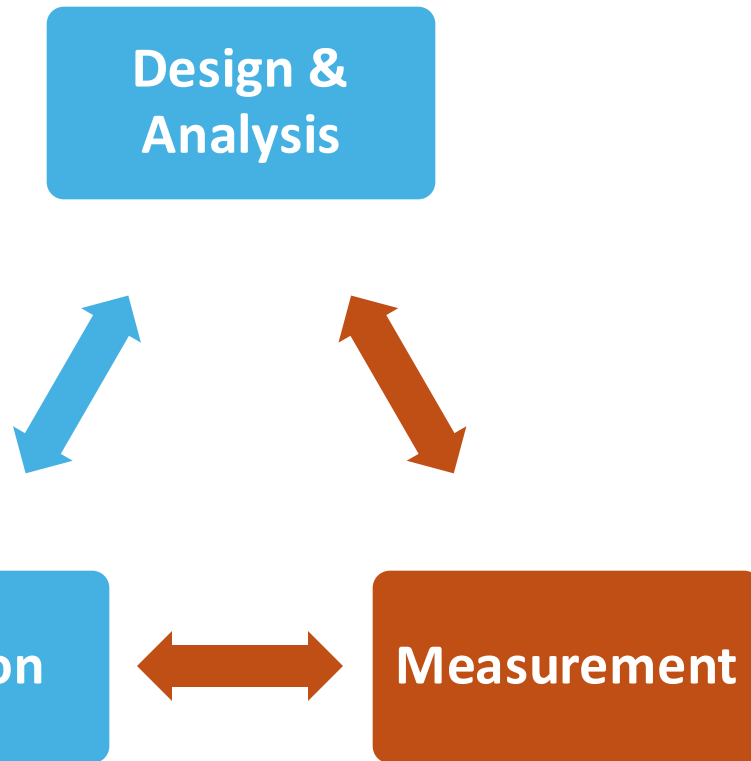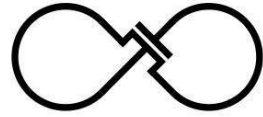<https://sscs.ieee.org/technical-committees/tc-ose/sscs-pico-design-contest/>

MOSbius Mission
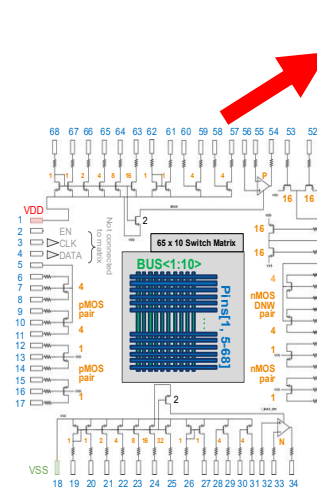
Make it easy for learners to experiment with CMOS transistors in circuits relevant to IC design

https://mosbius.org

Motivation: Learning IC Design
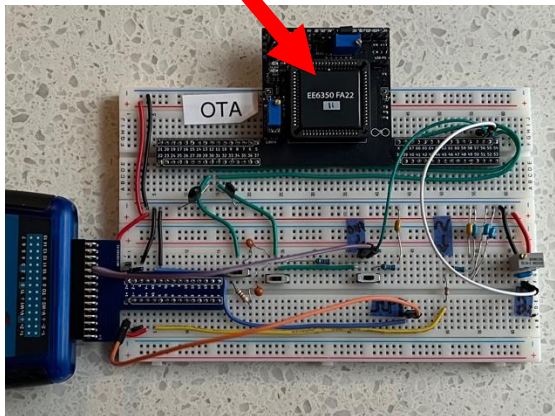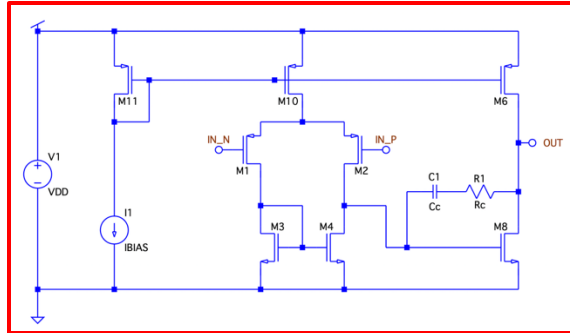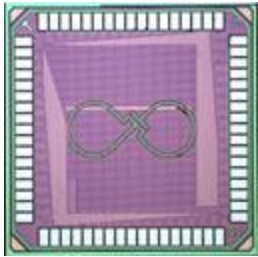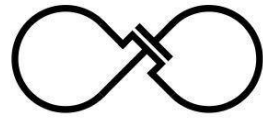
Design & Analysis

Simulation

Measurement

Simulators only answer the questions you ask them … What questions should you be asking?

Silicon does what *it* wants to do, not always what *you* want it to do …

What is MOSbius, so far?

Programmable On-Chip Switch Matrix

Custom Digital

Building Blocks

connected to pins

Custom Analog

What is MOSbius, so far?

- Website
- Programming support
- Simulation support

https://mosbius.org

Current version: focus
on transistor-level
analog design

MOSbius Chipathon Ideas
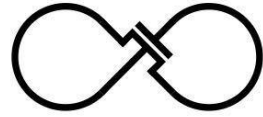
- Port current MOSbius (in part) to GF180
  - Significant benefits that everything will be in open-source, in particular layouts → 3D animations, …

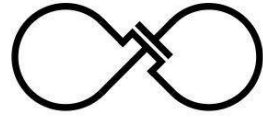- Develop '*digital-transistor-level*' MOSbius
  - DFFs, logic gates, … at circuit level

- (very advanced) RF MOSbius
  - RF building blocks to configure various RF receiver topologies

- **Your Ideas ….**

MOSbius Chipathon Goals

- Think about use cases for your chip
  - What experiments can your chip support?
  - How will your chip & experiments draw people into IC design?
  - How easy will your chip be to use, program, …

The design goals are not only about the design and tape-out, but also about your chip's application, i.e., what experiments your chip can support.