Overview

- Who is Staf Verhaegen
- Chips4Makers: What, Why?
- Chips4Makers, NGI0 and libre-SOC
- Chips4Makers & European Semi-conductor Industry
Who is Staf Verhaegen?

- Employed 1995-2019 @ imec: World’s biggest semi-conductor research institute located in Belgium
- 2011-2019: DARE (Design Against Radiation Effects)

https://dare.imec-int.com/
Who is Staf Verhaegen?

- Employed 1995-2019 @ imec: World’s biggest semi-conductor research institute located in Belgium
- 2011-2019: DARE (Design Against Radiation Effects)
  - Development of radiation hardened standard cell/IO libraries and SRAM compiler
  - Setup/maintain internal mixed-signal rad-hard design flow
  - Customer support for DARE library users amongst others: triage customer issues based on knowledge of full RTL2GDS flow
Who is Staf Verhaegen

- DARE development inside IC-link department
  IC-link does also: Europractice, MPW ASIC service, ...

Who is Staf Verhaegen

- Retro-geek

Commodore 64

Amiga
Who is Staf Verhaegen

• Retro-geek

• Open source software developer
  - AROS: Amiga Research Operating System
    Open-source re-implementation of AmigaOS
  - Linux, Python, …
Chips4Makers: Why, What
Chips4Makers: Why, What

- Quote for retro-inspired SoC
  - 0.35µm TSMC multi-project wafer (MPW): < $5000
  - From design to silicon (e.g. RTL2GDS): > €30 000

- EDA cost should be more in line with mature chip production costs
=> open source
Chips4Makers: Why, What

• What:
  – low-cost, low-volume ASIC service (https://chips4makers.io)
    current target: 0.35µm technology
    
    | Chips | Price   |
    |-------|---------|
    | 50    | €1750   |
    | 51-100| €28/chip|
    | 101+  | €20/chip|
  
  – Fit for makers/hobbyists:
    • no NDA
    • open source tooling
Chips4Makers, NGI0 and Libre-SOC
Chips4Makers, NGI0 and Libre-SOC

- Common interest with Libre-SOC project:
  - Libre-SOC: need for cost-effective prototype possibility using libre licensed software
  - Chips4Makers: good test case for flow

=> together with LIP6 - Sorbonne University develop flow to allow 0.18µm prototype of Libre-SOC. More details in Luke’s presentation.
Chips4Makers & European Semi-conductor Industry

• Low-volume/low-cost ASICs alone will not be able to drive European Semi-conductor industry
But:

  – Growing the ecosystem
    Increasing the pool of people with ASIC design expertise
    => also increase demand for high volume ASICs

  – Not only limited to academia and professional design houses.

  – Drive innovation of the tool chain by a lot of people
    ‘scratching their own itch’.
    Like for example the Linux ecosystem where Motorola M68K linux
    is still developed in parallel to x86, AMD64, ARM, RISC-V, ...