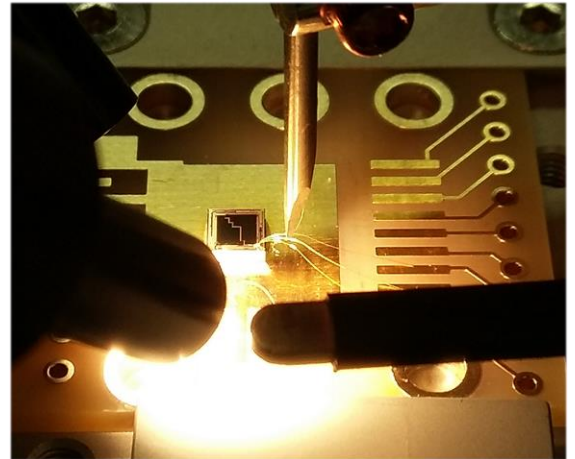


# Master Thesis

## Advanced process nodes for analog radiation tolerant ICs



### Motivation

Advanced CMOS process nodes like 28 nm and 40 nm have been introduced in commercial products several years ago. Usage of these processes for high performance digital circuits is being continuously and broadly exploited. But their applicability for analog functions of mixed-signal systems is still to be further explored. In particular this is an interesting research area for particle physics experiments, where scaled down MOS transistor features could offer advantages for radiation tolerance, which is a subject of this research project.

**We're looking for a candidate interested in device physics and IC design.**

### Objectives

- Getting familiar with general radiation effects in MOS transistors
- Understanding key differences between 28nm and previous CMOS generations
- Identifying issues and potentials of 28 nm / 40 nm in analog applications for highly ionizing radiation environments

### Approach/Methods/Tasks

- Literature research oriented towards process details and known radiation effects
- 2D TCAD modeling and analysis of PMOS and NMOS transistor
- Process studies in Cadence environment based on documentation and simulations, including representative design examples

### Organizational matters

- Begin: February 2019
- Working place: IFE/TU Graz, Inffeldgasse 12
- Employment as "Studentische Projektmitarbeiter" for at least 4 months 20h/week is envisaged for the dominant part of the work in frame of the "SIRENS" project. Supervision of the master thesis will be continued beyond that period.

### Contact IFE:

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