BUT Semiconductor Technology Hub

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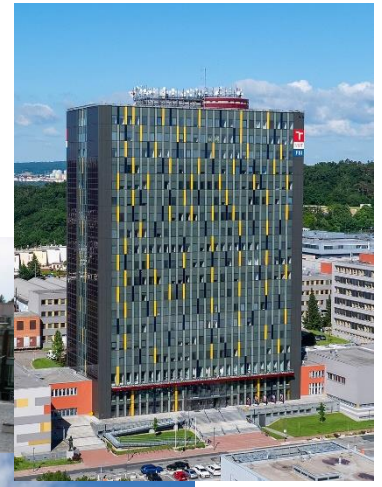
Faculty of Chemistry
Central European Institute of Technology

CHIP DESIGN & SEMICONDUCTOR TECHNOLOGY OVERVIEW

- AÀÁÃ ŹŽÆÉÁĂfjÉŽĀ ÁŁÅĂŹcZBÅÆBŽZÀĂÅÄÅAċ ŶĂŹ Ā ŶBŽÆÊŶÄÉfī ÂŶZcÄBċ ÅŻÁÄŽZBÆÉŹŶÄÁĂAÃÃŽŽÆÊA ŶĂŹ AÅĀ Ā cĂÁŁŹŶBÃÅĂ fÃÂÁÁAffj
- ĈŽĀ ÁŁÅĂŹcZBÅÆBŽZÀĂÅÄÅAċ ŶĂŹ Ā ŶBŽÆÊŶÄÉfī AŽĂBÆŶÄÁcÆÅŽŶĂ ÃÑÁÆBÁBcBŽ ÅŻČŽZÀĂÅÄÅAċ fÃÁÁČÁAffj
- AÀÁÃ ÅÆÅAÆŶĀ Ā ÃÑAfjŹÁÁBŶÄŹŽÆÁĂ fī ÂŶZcÄBċ ÅŻÃÑŻÅÆĀ ŶBÃÅĂ ČŽZÀĂÅÄÅAċ fÃÂČffj
- BÀċÁÉŁÁÉÅŻÁŽĀ ÁŁÅĂŹcZBÅÆÉfī ÂŶZcÄBċ ÅŻĄŽZÀŶĂÁŁŶÄÁĂAÃÃŽŽÆÊA fÃÂĄÁffj
- ĈŽĀ ÁŁÅĂŹcZBÅÆBŽZÀĂÅÄÅAċ ŶĂŹ Ā ŶBŽÆÊŶÄÉfī ÂŶZcÄBċ ÅŻAÀŽĀ ÁÉBÆċ fÃÂAÄffĵ
- BÄŶZŽŹ ÃÑ ŸÆŶĂŹ ĂŽĈ cĂÁĆŽÆÉÁBċ ZŶĀ ÅcÁÉÅŻöÆÅÅ ČŽZÀĂÅÄÅAċ BŶÆÃfj
- ÀÁÀÀ ĄcŶÄÁBċ ŻŶZÂÄBÁŁÁÉŶĂŹ ŽĄcÁÃĀ ŽĂBfj
- BŽŶĀ ÁÉÅŻÁÃÂÄŽŹ ÅÆÅŻŽÁÉÁÉÅÆÉŶĂŹ ċÅCĂA ÀÁÀÄC Ā ÅBÁĆŶBŽŹ ŶÆÉÉÁÉBŶĂBÉ ŶĂŹ BÀfÀfjÁÉBcŹŽĂBÉfĵ

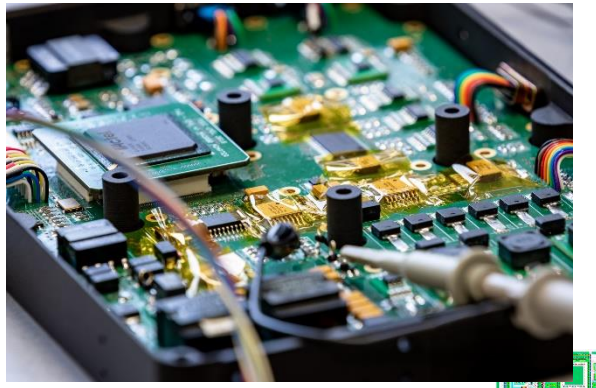


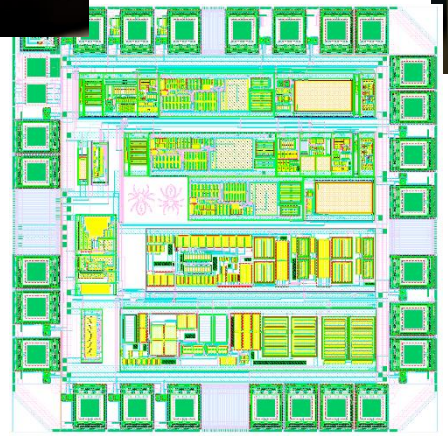
AÄÆB ÀÁÇÃÆ¡ ÇÁĄÃÆÉÆÀĊAČÉĆ ČÁAÄÆÉÅÉÃÐ ÉÇÁĆÇÃD

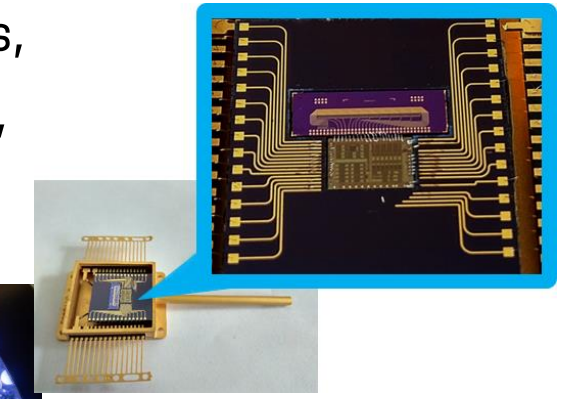
- Faculty of Electrical Engineering and Communication
  - Chip design – analog, digital, mixed-mode,
  - Semiconductor technologies including WBG,
  - Nanotechnologies, sensors,
  - Packaging and interconnection,
- Faculty of Mechanical Engineering
  - Semiconductor technologies,
  - Photonics,
  - Instrumentation and diagnostics,
  - Nanotechnologies,
- Faculty of Information Technologies
  - Digital design – low power, IPCore,
  - Chip programming,
  - RISC-V, ARM core architecture design – AI, cybersecurity,
- Central European Institute of Technology
  - High-tech clean rooms for chip fabrication,
  - Semiconductor technologies.

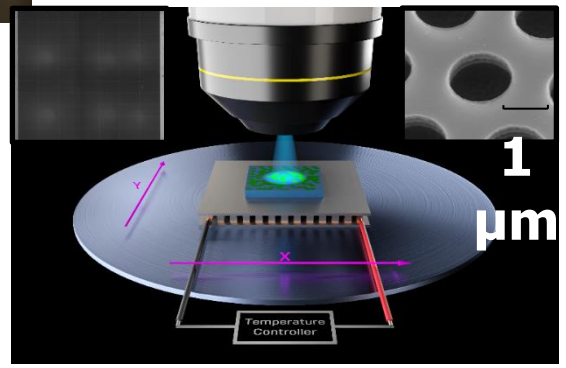
Department of Microelectronics - What we do …

- Four basic groups
  - sensor applications and nanotechnology,
  - ASIC design and verification & special space applications,
  - electronic components, devices and embedded systems,
  - packaging, mounting technology & hybrid IC.









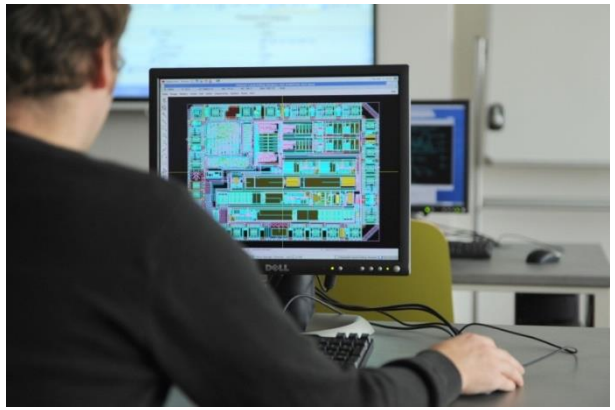
ĈČĊÀĐBĆÆÃĆōĄĄÁĈ

- Czech study programmes
  - bachelor – Chip Design and Modern Semiconductor Technologies
  - master – Chip Design and Modern Semiconductor Technologies
  - doctoral – Microelectronics and Technology

- English study programmes
  - bachelor – Electronics and Communication Technologies
  - master – Microelectronics – also as double-degree in cooperation with Northern Illinois University
  - Chip Design and Modern Semiconductor Technologies – open 2026
  - doctoral – Microelectronics and Technology

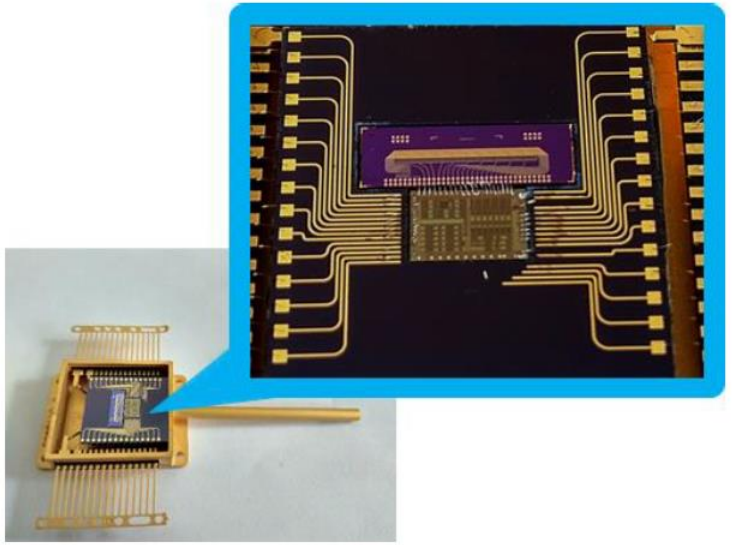
Main areas in ASIC design

- Sensor applications, sensor signal processing,
- mixed-mode integrated circuits,
- low-voltage low-power design,
- digital signal processing,
- algorithm development and implementation,
- space applications design.



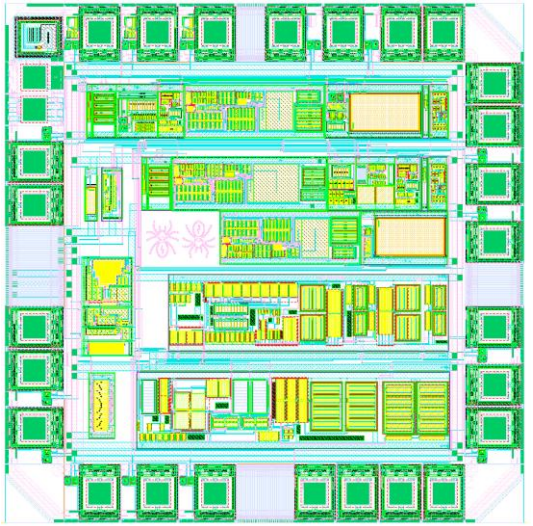
imec

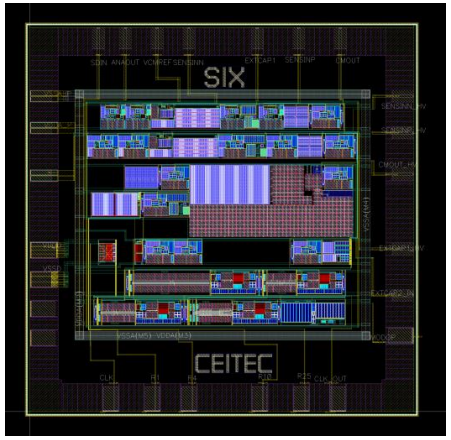
EUROPRACTICE

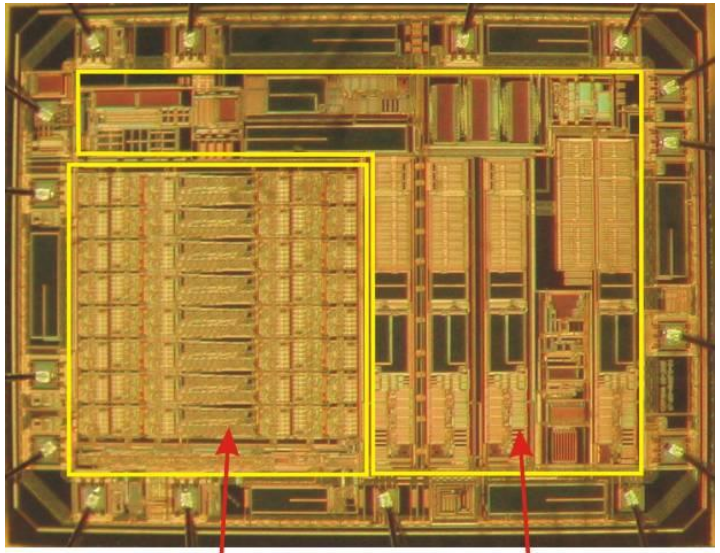


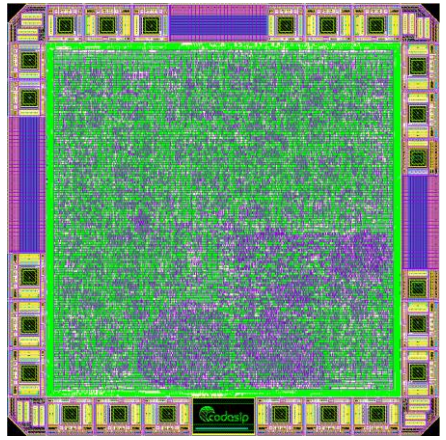
ASIC DESIGN OVERVIEW

- First chip designed in 2002 – 0,7 um technology,
- 13 different ASICs since the first chip,
- Mostly for
  - biomedical area,
  - sensor applications,
  - digital applications,
  - space, etc.









Cooperation – industry, clusters

Cooperation – Academics, alliance

Tampereen yliopisto
Tampere University

TU WIEN
Technische Universität Wien
Vienna University of Technology

Technische Universität Dresden

Universitat Rovira i Virgili

SDU
University of Southern Denmark

LUT
Lappeenranta University of Technology

Northern Illinois University

Leibniz Universität Hannover

Lund University

國立中央大學
National Central University

國立清華大學
National Tsing Hua University

Madanapalle Institute of Technology & Science

國立中興大學
National Chung Hsing University

CERN

國立臺灣大學
National Taiwan University

Tamkang University

國立陽明交通大學
National Yang Ming Chiao Tung University

EULIST

University of South-Eastern Norway

香港科技大學
The Hong Kong University of Science and Technology

University of Applied Sciences Munich

České vysoké učení technické v Praze

STU
Slovenská technická univerzita v Bratislave

Northwestern Polytechnical University

Technická univerzita v Košiciach

BUT SVC ACTIVITIES, MEMBERSHIP, PROJECTS

- ō Ā ŽĀ ŸŽÆåŻAÇŽZÀ ÆÝBÅĂŶÄĈŽĀ ÁŹåĂŹcZBÅÆAÄCÁÆBŽÆfj
- ōŹĆŶĂZŽŹ AÀÅÅ ÀŽÆÁÅĂ ŶĂŹ ĆŽÆŽŶÆŹÀ AŽĂBŽÆfðAÀĆAftfī ZÅÅÅŽÆÝBÅÅĂ ĉ ÁBÀ ČŶÆĈ ŶĂ cĂÁĆŽÆÉÁBÅŽÆŶĂŹ ÃŹcÁÆBÆĊfjÁÆBÝÆBCäĝäâäăfjă ĊŽŶÆÉfjæéfâ ĄĊĈÀfj

ACDRC
Advanced Chip Design and Research Center

- AÀÅÅÁÆåŻÁcÆÅÅŽ fī ÀÁÅÁBÝÄÁcÆÅÅŽ ŻcĂŹÃÅAfjÁÆBÝÆBCäĝäâäăfjă ĊŽŶÆÉfjæéfâ ĄÁcÆÅfj

CHIPS of Europe

- AÇŽZÀ ĈŽĀ ÁŹåĂŹcZBÅÆAŽĂBŽÆffÅĈAftfī AÀÅÅÁÉĂĊ ŻcĂŹÃÅAfjÅÆŽÅŶÆÝBÅÅĂfjÁÆBÝÆBCãĝäâäåfj ă ĊŽŶÆÉfjæĄÁcÆÅfj

CSC

Looking forward for our cooperation!