



Central European Institute of Technology  
BRNO | CZECH REPUBLIC

# CEITEC

## Cybernetics in Material Science

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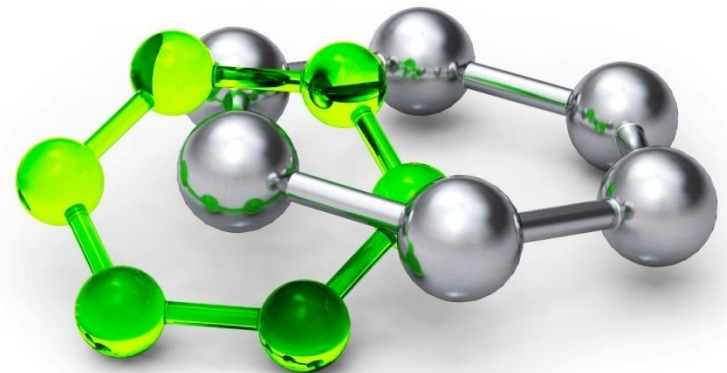
**February 4<sup>th</sup>, 2015**  
Brussels



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**OP Research and  
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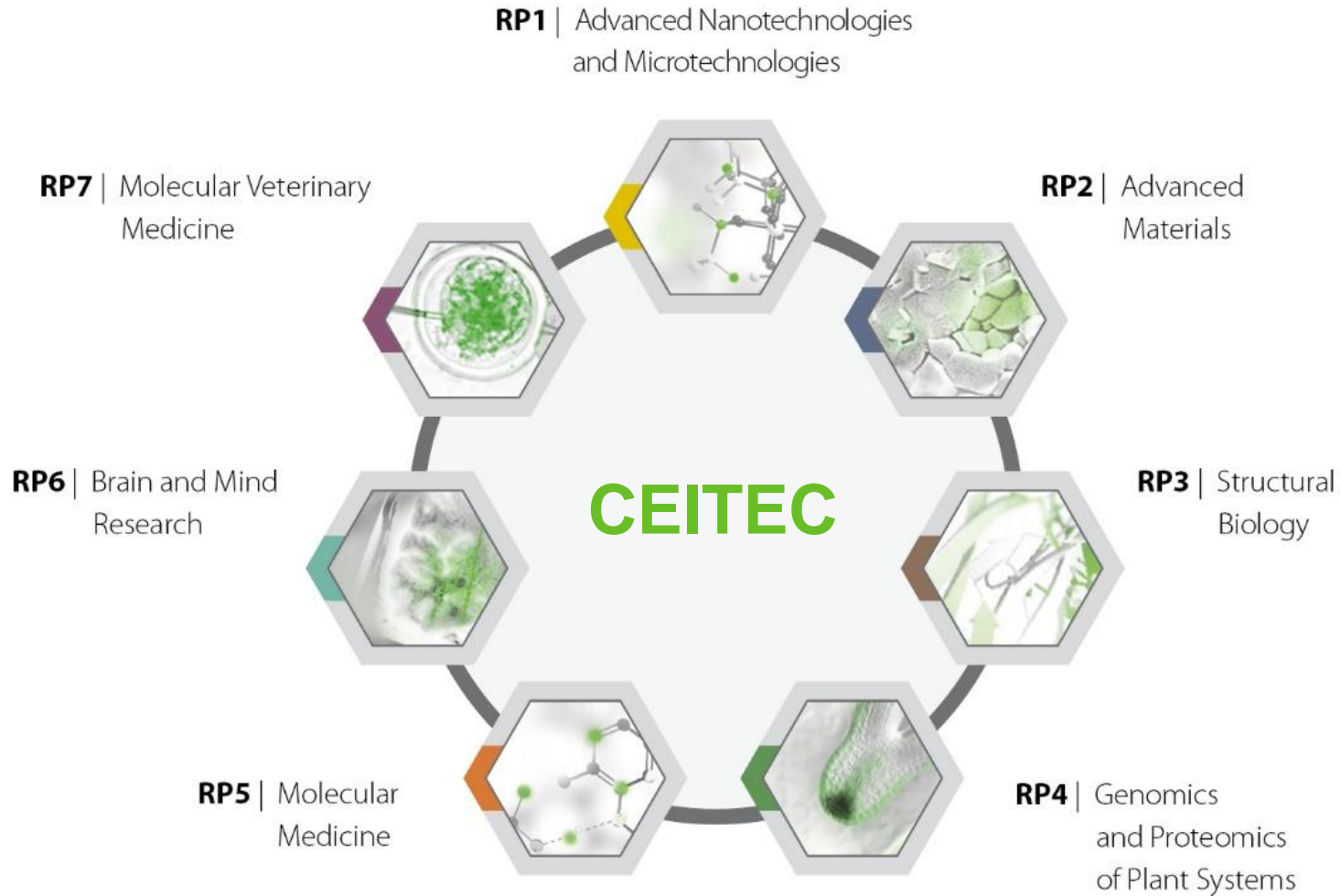
# Aim and Vision

“ *CEITEC is a scientific centre in the **fields of life sciences, advanced materials and technologies** whose aim is to establish itself as a recognized European centre of science.* ”

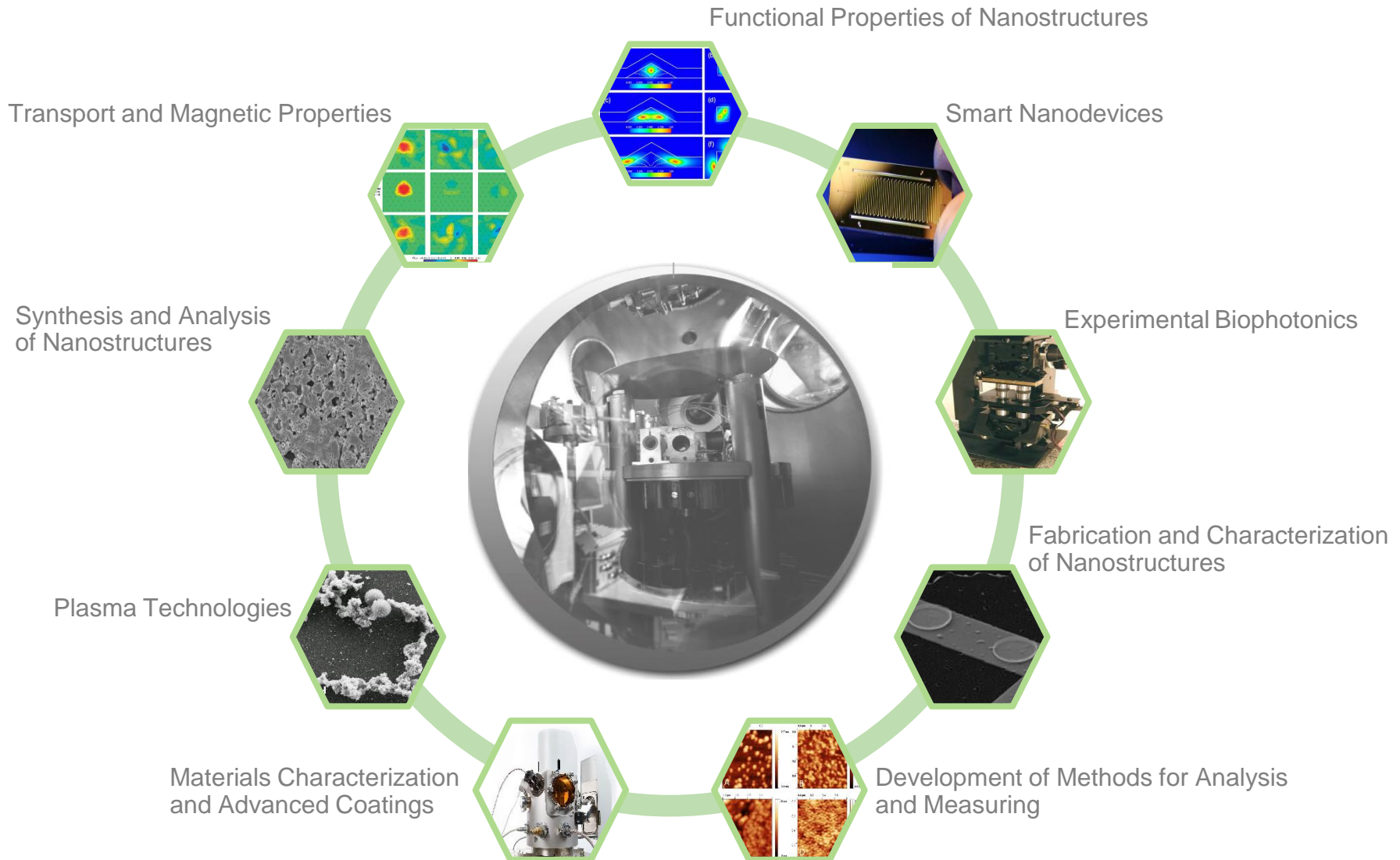
*CEITEC is leading a path to global scientific recognition through synergy and collaboration, in order to achieve a regional knowledge-based economy.*



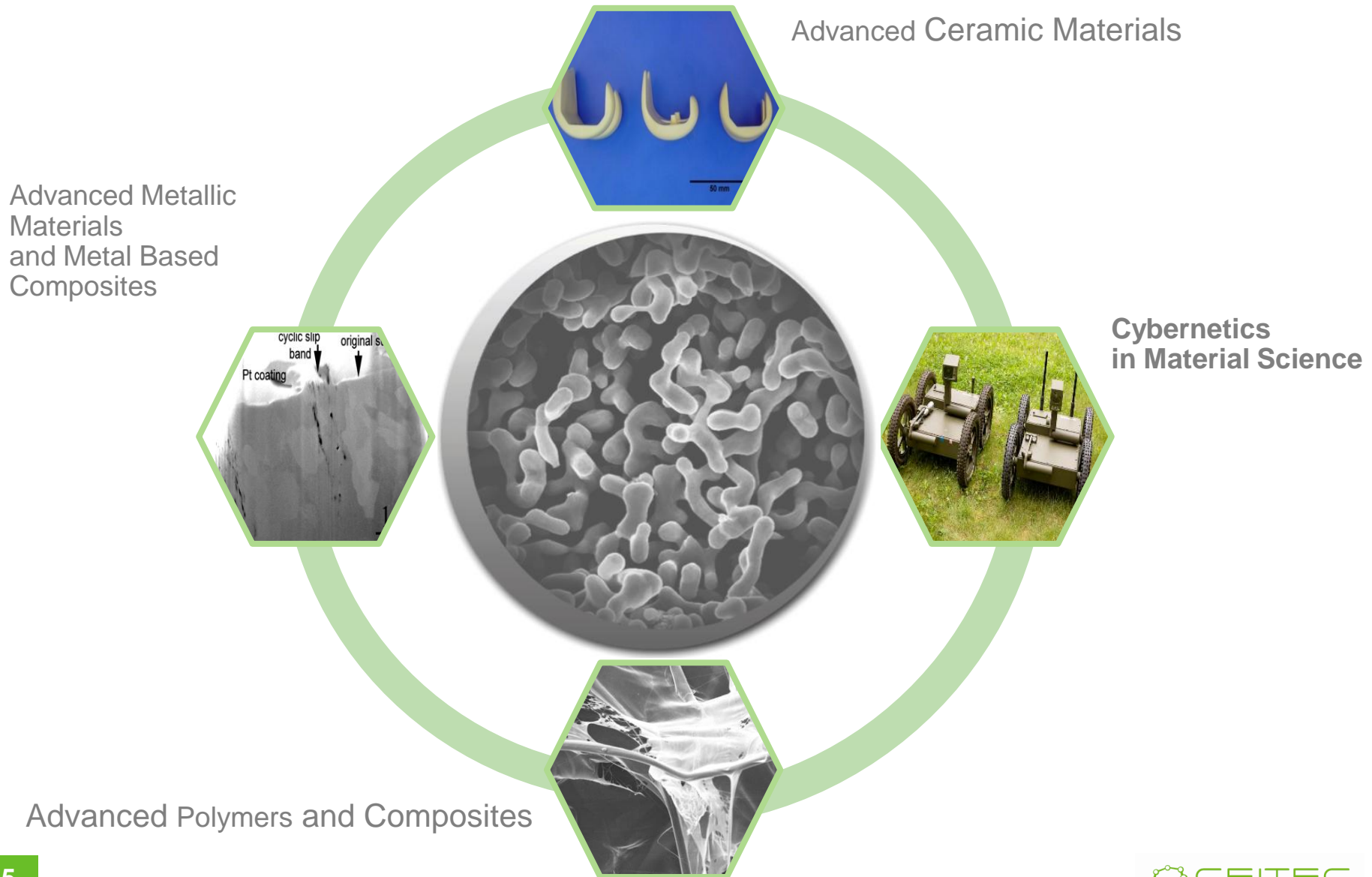
# Research Programmes



# Advanced Nano and Microtechnologies

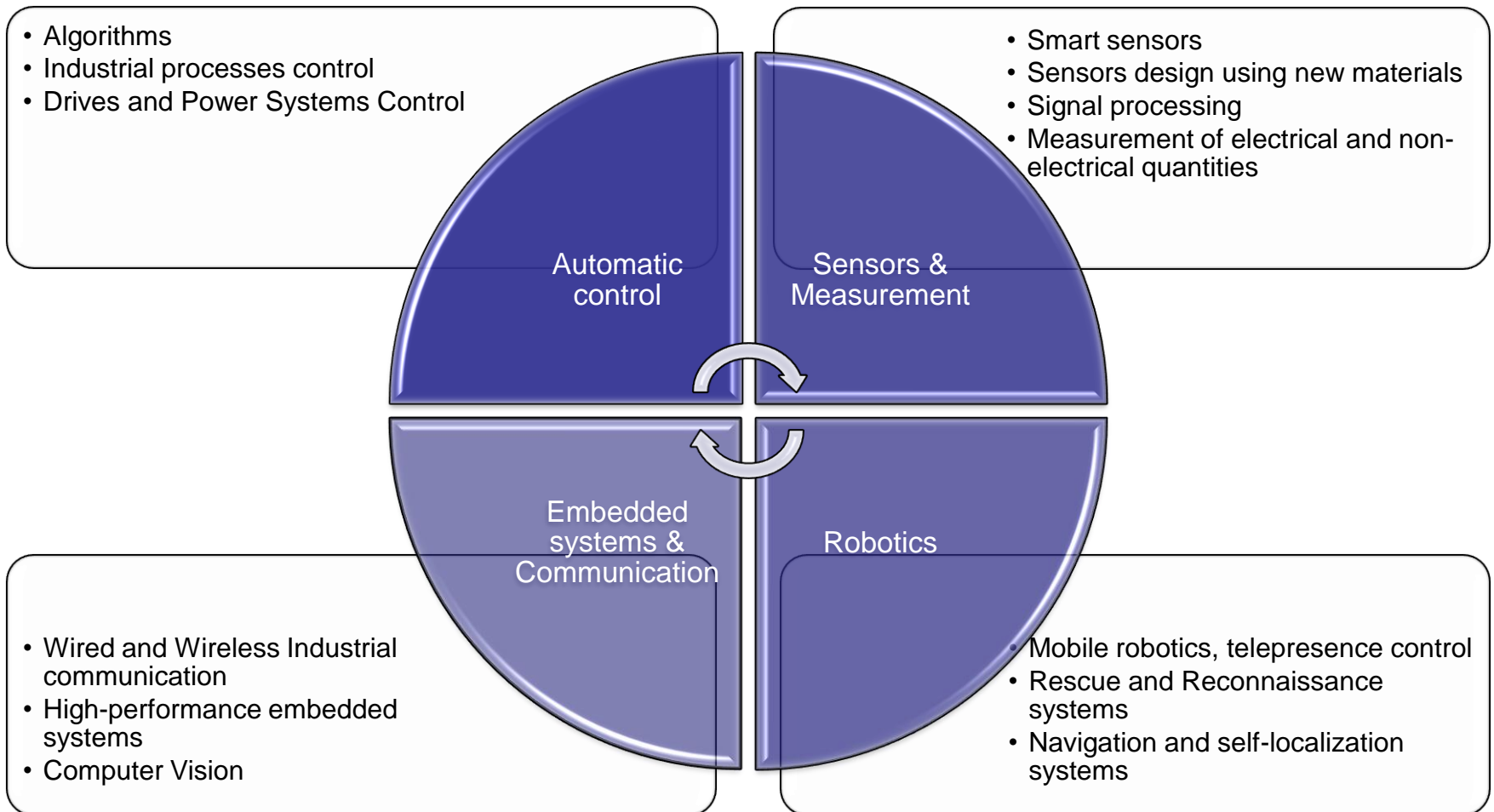


# Advanced Materials



# Research topics

## Cybernetics in Material Science

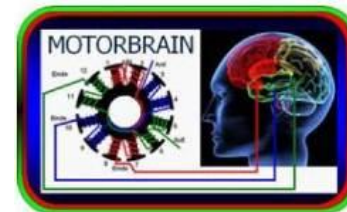
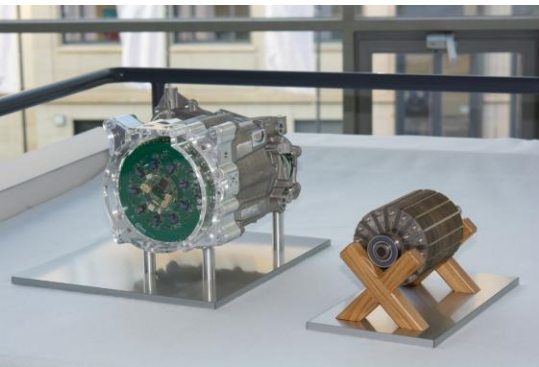


# Related projects

## MotorBrain

### Nanoelectronics for Electric Vehicle Intelligent Failsafe Power Train

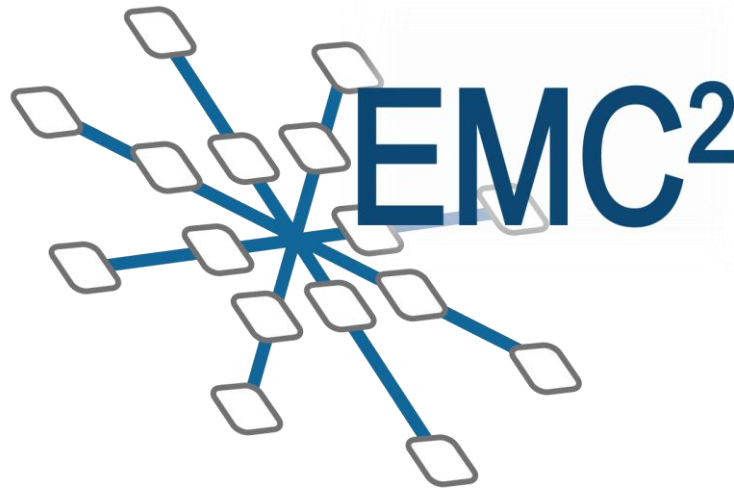
- FP7 ENIAC initiative project, 2011-2013 - 30 partners from Austria, Czech Republic, Germany, Spain, Italy, Netherlands, Romania, Sweden, United Kingdom – Infineon, Siemens, ZF Friedrichshafen, Fraunhofer, TU Dresden, NXP, ST Microelectronics, Fiat,...
- Development of a new powertrain for electrical car, CEITEC involved in the drive control system design and implementation
- RG involved in electrical drive advanced fault tolerant control, energy efficient control, drive and electronics diagnostics
- Prototype presented at the Hannover Messe "MobiliTec" in 2014



# Related projects

EMC2 - Embedded multi-core systems for mixed criticality applications in dynamic and changeable real-time environments

- large FP7 JTI ARTEMIS project (2014 – 2017) – 100 partners, over 100 mil. EUR (Infineon, BMW, AUDI, Volvo, ABB, Fraunhofer, NXP, Siemens, AIT, Thales, Rockwell, TU/e, Technion)
- CEITEC responsible for development of control algorithms for industrial drives, e-car powertrain control, computer vision





# Related projects

## 3CCAR - Integrated Components for Complexity Control in affordable electrified cars

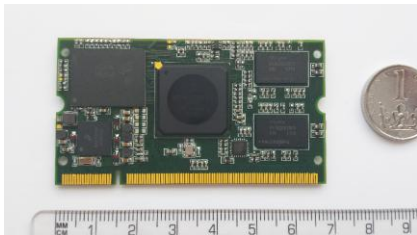
- large H2020 JTI ECSEL project (2015 – 2018) – 50 partners, over 50 mil. EUR (Infineon, BMW, Daimler, Fraunhofer, Siemens, OTH-AW, TU Dresden, AVL, AIT, ITRI Taiwan,.....)
- CEITEC responsible for development of control algorithms for powertrain and smart servos, electrified car energy management.



# Related projects

## IDEAS - Interactive Power Devices for Efficiency in Automotive with Increased Reliability and Safety

- Midscale H2020 JTI ENIAC project (2012 – 2015) – 17 partners, nearly 10 mil. EUR (Centro Ricerche Fiat, Polytechnic University of Turin, SINTEF, BUT, IMA, )
- BUT responsible for SW and HW platform design and development in order to prepare Data Processing Memory System test-bed for testing high-speed communication, real-time parameters and security functions. Research of methods for increasing data processing security, real-time parameters, and communication throughput in multi-core data processing systems.



# Cooperating institutions (international projects and contract research)

- Bavaria and Germany
  - Infineon Technologies
  - Siemens
  - Fraunhofer
  - ZF Friedrichshafen
  - TU Dresden
  - Ostbayerische Technische Hochschule Amberg-Weiden
- Other companies
  - Freescale Semiconductor
  - Honeywell
  - National Instruments
  - ABB
  - Rockwell Automation
  - Brüel & Kjær
  - DIGNIO
  - Saab

# CEITEC BUT

## University Campus Pod Palackého vrchem





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