Technische Universität München

ideas for a European technology transfer platform

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TUM. The Entrepreneurial University.

Elite University = Top-Level Research + Excellent Teaching

International top-level research

Education focusing on concrete scientific topics

Strong link to industry

Science and technology for people

Cosmopolitan attitude and global cooperation

 # 53 QS World University Ranking 2012/13 (14 in Europe)
 # 53 Academic Ranking of World Universities ARWU 2011 (12 in Europe)

Why TUM ?

Sustainability, innovation and competitiveness can only be achieved at a European level

- ✓ **TUM** guarantees excellence in research and training, with strong emphasis on entrepreneurial issues and a broad offer of expertise's
- ✓ Strong commonalities between **Bavaria** and Emilia-Romagna

Existing links, best practice and an established expertise play a fundamental role in international cooperation's

- ✓ The **Institute for Nanoelectronics** at TUM has a long standing series of collaborations with universities, research labs, associations and companies in Emilia-Romagna
- ✓ It focuses on innovative research with emphasis on application
- ✓ It is lead by a professor born in Emilia-Romagna

The Institute for Nanoelectronics

Grounded in 2002 in the Department of “Electrical Engineering and Information Technologies”

Staff:

1 Full Professor, 2 Associate Professor (from 2012-13), 1 Professor Emeritus,
6 Post Doctors, 21 PhD students,1 Technician, 1 Secretary

International training activities:

- Joint Master Programme NTU/TUM "Integrated Circuit Design„
- Joint Master Programme NTU/TUM „Microelectronics„
- Joint Ph.D. Programme with Universita‘ delle Marche (Italy)
- Joint Ph.D. Programme with NTU (Singapore)
- Erasmus Programme with Uni. Salerno, Uni. Rom Tor Vergata und Uni. Bologna
- Leonardo Programme with Ass. Amici del Museo, Bologna
- ITN Marie Curie Networks

- Cooperation with several international universities, research labs and companies

The “Leonardo da Vinci” Programme

Istruzione e cultura
Leonardo da Vinci

Leonardo da Vinci - Initial Vocational Training

The action aims at the support of transnational mobility of persons undergoing initial vocational education and training based on alternate learning taking place at the workplace (enterprise) as well as in school.

The general objectives of this mobility action within the Leonardo da Vinci sectoral programme are:

- To support participants in training and further training activities in the acquisition and the use of knowledge, skills and qualifications to facilitate personal development, employability and participation in the European Labour Market.
- To enhance the attractiveness of vocational education and training and mobility for individuals and to facilitate the mobility of working trainees.

10 internships (each 6 months long) organized by the Bologna association *Amici Museo del Patrimonio Industriale* have taken place at TUM-NANO in the years 2010-2013 on the topics:

- Smart packages
- Electromagnetic simulations
- Design of organic solar cells
- Sensors based on carbon nanotubes
- Spray coating technologies

Marie Curie Actions

Initial Training Networks (ITN) - Marie Curie Actions

CONTEST : Collaborative Network for Training in Electronic Skin Technology (started 1.10.2012) with 12 early stage researchers + 2 experience researchers

Partners: *FBK Trento*, TUM, Imperial College, University College London, EMTS (Fraunhofer Gesellschaft), STMicroelectronics, Shadow)

OLIMPIA: Training Network on Optoelectronics Integrated with Living Systems for Neuroscisnce Investigations and Applications (started 1.10.2012) with 12 early stage researchers + 2 experience researchers

Partners: *CNR Bologna*, Center for Molecular Biology and Neuroscience Norway, Ecole Nationale Supérieure des Mines de Saint-Etienne, IIT Milano, Universidad del Pais Basco, TUM, Imperial College London, Siemens, ETC Bologna, Histocell)

ORGBIO: Organic Bioelectronics (starting 1.10.2013) with 13 early stage researchers + 2 experience researchers

Partners: *TUM*, Ecole Nationale Supérieure des Mines de Saint-Etienne , Universidad del Pais Basco, Universita' di Bari, Imperial College, University of Rijeke, Dublin City University, Linkopings Universitet, Helmholtz Zentrum München, CNRS Paris, STMicroelectronics, Plasma Solution, Ibidi

A technological platform

Universities can provide advanced technological platforms (in our case e.g. spray coating technologies for carbon nanotubes and conductive polymers) which can be very attractive for large companies and for SMEs in several strategic innovation areas such as

SENSOR TECHNOLOGY

Autonomous sensor networks
Organic biosensors
RFID-based sensors
Disposable environmental sensors

PROCESS INNOVATION

Intelligent packaging
Artificial skin for robots
Vision systems (also infrared)
CNT-based coating

ENERGY

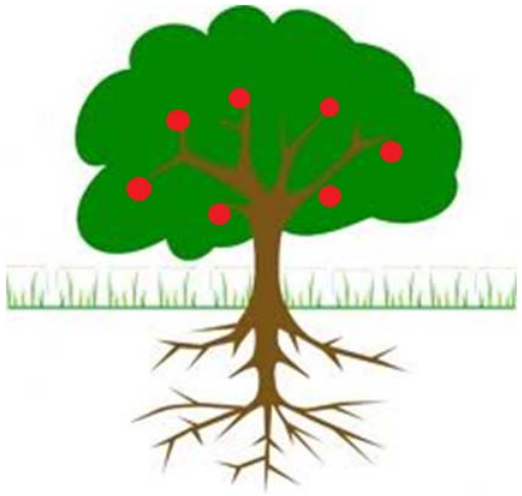
Energy harvesting
Monitoring instruments
Technologies for e-vehicles
Photovoltaics and photocatalysis
Low power devices

Bringing technology transfer at a European level

- Due to its inherent flexibility, a university is the ideal research/training partner for large companies as well as SME (independent of the country where they are located)
- It can collaborate with single industrial entities as well as with industrial clusters like E.R.-AMIAT
- It can act as an effective link between industries and large research institutions (e.g. FhG, CNR, CNRS) of different countries
- It can promote technology transfer by exporting its innovation to industry and by sharing its know-how via students and researchers
- It can offer continuing education and requalification for industrial technical staff (including managers)

… back to the leaves and the tree

Universities should and could be the leaves that collect and transfer new energy into the complex industrial system represented by a fruit-bearing tree



… but universities should not and cannot be the leaves that cover up some original sins like lack of innovation and competitiveness