Joint projects within the Euroregion Pomerania

Greifswald, August 19, 2010
BalticNetPlasmaTec Project

• everything began in 2002
• the first meetings took place at the Koszalin University of Technology and in the Institute of Low Temperature Plasma Physics (INP), Greifswald
  o participants:
      o Prof. Klaus Dieter Weltmann, INP Greisfwald
      o Mr Mario Kokowsky, Technologie Zentrum Vorpommern (TZV)
      o Prof. Leon Kukielka, Dean of Mechanical Engineering Department (MED)
      o Mr Włodysław Husejko, Director of Science and Technology Park of KUT
      o Prof. Jerzy Ratajski (Physics Division of MED)
      o Dr Jan Staśkiewicz (Physics Division of MED)
      o Prof. Witold Gulbiński (Physics Division of MED)
      o Dr Piotr Myśliński (Regional Center of Vacuum Plasma Technologies, KUT)
Partners of the *BalticNetPlasmaTec* Project:

- Technologie Zentrum Vorpommern (TZV), Greifswald
- University of Greifswald, Institute of Physics
- Koszalin University of Technology: the Science and Technology Park and the Department of Mechanical Engineering – network point of *BNPT*
- Science and Technology Park, Szczecin

*Project duration: 2005-2008*
Activities of the project aimed at:

- popularization of knowledge on physics and applications of low-temperature plasma,
- organization of lectures in schools,
- educational visits of pupils at the Koszalin University of Technology,
- participation in scientific fairs and Science Festivals,
- printing of the educational brochures, holding contests related to physics and plasma technology.

There were about 20 events organized.
International Summer Schools on physics and plasma technology, organized jointly with:

- Ernst-Moritz-Arndt University, Greifswald,
- Charles University, Prague
- Christian-Albrecht University, Kiel

Four editions of the summer school were organized in Greifswald, Koszalin and Prague.
Total number of participants – about 75
„International Student Summer School” <Nanotechnologies in Materials Engineering>

- organized jointly with Warsaw University of Technology,
- in years 2006 and 2007,
- total number of participants: 45
Seminars on plasma techniques for physics teachers
(5 editions organized) in:
- Max-Planck-Institut für Plasmaphysik Greifswald
- Leibniz Institute for Plasma Science and Technology (INP Greifswald e.V.)
- Institute of Nuclear Research, Świerk (PL)

Total number of participants: 65
Surveys among production facilities in Polish part of Pomerania Euroregion, with the scope of:

- verifying the actual application scale of plasma technologies,
- establishing potential needs for application of low-temperature plasma based technologies,
- information exchange between Polish and German partners.
New projects related to the mission of the *BalticNetPlasmaTec* network have been worked out.

Establishment of the **Institute of Mechatronics, Nanotechnology and Vacuum Technique** in the Koszalin University of Technology.
- the Institute was established in the year 2007 by the resolution of the KUT Senate, dated January 17th.
- the Institute is one of the main beneficiaries of activities initiated by the *BalticNetPlasmaTec* project.
The project in the framework of the INTERREG IIIA Programme:

German partners of the project:

- Ernst-Moritz-Arndt University Greifswald,
- Leibniz Institute for Plasma Science and Technology (INP) Greifswald

Results of the project were promoted in Pomerania Region in both, Polish and German languages, thanks to a tight collaboration with TZV Greifswald.
Main results of the project:

- renovation of laboratories and technical installations,
- purchase and start-up of a unique technological device for deposition of diamond-like coatings on tools,
- elaboration and implementation of technology of wear resistant coatings for wood-working tools.

Budget of the project: 400 000€
Number of industrial partners: 4

The project was awarded with “Zachodniopomorski Nobel 2007”.
Co-elaboration of the project:

South Baltic Plasma Training Network within the framework of the EU program "South Baltic Cross-border Co-operation Programme 2007-2013".
Partners of the project:

- Technology Centre of Western Pomerania
- Ernst-Moritz-Arndt University Greifswald
- Wismar University of Applied Sciences, Technology, Business and Design
- Leibniz Institute for Plasma Science and Technology
- Technical University of Denmark, Risø National Laboratory for Sustainable Energy
- Klaipeda University, Mechatronics Science Institute (KU)
- West Pomeranian University of Technology, Szczecin (ZUT)
- Koszalin University of Technology
The project aims at an implementation of education systems in direct contact between science and industry. The scope: an effective use of plasma technologies.

- execution period: 2010-2013,
- expected budget: 2.4 mln EUR
4. Co-elaboration of the project:

„International Plasma Technology Transfer Centre”
within the framework of EU programme: INTERREG IVA

Preliminary partner agreement was signed during the meeting at the Koszalin University of Technology on March 19th, 2008.
The project is aimed at:
- Elaboration of the concept and establishment of a common unit for the implementation of plasma technologies, based on the scientific and research potential of network partners in Greifswald, Szczecin and Koszalin.

The leading partner of the project: **BalticNetPlasmaTec** network
Planned execution period: 2010-2013.
Expected budget: 3.3 mln EUR

**PARTNERS**

- **BalticNetPlasmaTec** network,
- Leibniz Institute for Plasma Science and Technology,
- Ernst-Moritz-Arndt University Greifswald,
- West Pomeranian University of Technology, Szczecin,
- Koszalin University of Technology.
5. The project “Hybrid technologies for surface modification of wood-working tools” in the framework of the Innovative Economy Program (PL) - currently executed in the Institute of Mechatronics, Nanotechnology and Vacuum Technique (KUT)

Budget of the project: 9.3 mln PLN (2.1 mln EUR)
CONFERENCES

The conference “Vacuum Technologies of thin films” in Mielno (2007), under the auspices of the BalticNetPlasmaTec network

The conference was attended by representatives of all low-temperature plasma research centers in Poland
Series of scientific symposia on “Vacuum based Science and Technology” organized under auspices of Polish and German Vacuum Societies and in collaboration with *BalticNetPlasmaTec*

- Kraków (2005)
- Greifswald (2007)
- Darmstadt (2008)
- Koszalin (2009)
- Kaiserslautern (2010)
- Koszalin (planned for 2011)

The *4th Symposium on Vacuum based Science and Technology (2009)* was inaugurated with a solemn session dedicated to famous German scientist *Rudolf E. Clausius*, born in Koszalin in 1822.

- about 90 participants from Poland, Germany, France, Russia, Danmark, Sweden, Hungary, Czech Republic and Portugal.
The project BalticNetPlasmaTec was indicated as an example of „Good Practices for Successful German-Polish Co-operation” by The Federal Ministry of Education and Research of Germany.
Centre of Excellence NANODIAM
Scientific research areas

Biomedical Engineering at KUT

NANODIAM = nanodiamonds in the form of layers or powders
Discovery of diamond bioactivity
Human gene expression

<table>
<thead>
<tr>
<th>Gene name</th>
<th>Encoded protein</th>
<th>PCR product length</th>
<th>Main inducing stimulus</th>
</tr>
</thead>
<tbody>
<tr>
<td>JUN</td>
<td>Jun activation domain binding protein</td>
<td>118</td>
<td>Cellular stress</td>
</tr>
<tr>
<td>FRAP1</td>
<td>FKBP-rapamycin associated protein 1</td>
<td>141</td>
<td>Genotoxic stress</td>
</tr>
</tbody>
</table>

JUN – is responsible for oxidative stress
FRAP1 – is responsible for proliferation of cancer cells

Technology development of nanocrystalline diamond coatings for medical purposes

"New technologies for medical applications: studying and production of carbon surfaces allowing for controllable bioactivity"
Thank you for your kind attention