

Expertise of TU Graz - Optical chemical sensors

Key expertise in luminescent dyes, polymer materials and opto-electronic instrumentation, and applications

Chemical parameters:

- Oxygen, pH, CO₂, NH₃, Glucose, K

Medical Diagnostics

- Point of Care

Industrial

- Process analytical technology
- Biotechnology
- Food packaging

Environmental monitoring

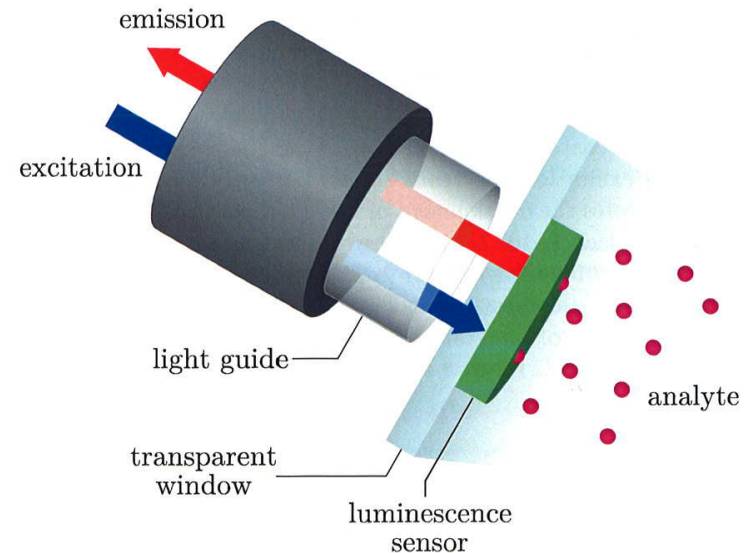
- Marine research

Microfluidics with integrated sensors

EU-Projects:

BiolIntense, SenseOcean, Schema, Spidiman (all FP7), Oxygen (ERC)

Spin-off company: Pyroscience GmbH



Advancing sensor materials

Sensor materials for various kind of sensors (not only optical) are compromised in the usage. To improve the acceptance of the end-user and a broader application sensor materials have to advanced in the following:

- Robust and selective sensor materials with long-term operational stability and shelf-life stability
- Ease in preparation and processing of sensor materials
- Easy to calibrate or Calibration free or factory calibrated sensors
- Extension of the number of analytes

Short to medium action needed

Instrumentation

cheap and **miniaturized** instruments with many functionalities (autonomous sensing, data logging, low energy, wireless connection)

Many application fields of sensor technology do not have high numbers in total - Problem economy of scale – Devices are expensive

Change by new manufacturing principles

3D printing, printed electronics, modularization, customize-able chips, wafer pooling, integration of optical components, etc.

→ **Enabling of small batch series – Chance for sensor technology**

Short to medium action needed

Marketing of sensor technology

Breaking the barrier of end-user against new technology

New technology in education

Sponsoring of sensor instruments by EU, i.e. lab courses → spreading of new technology

Competitions for solutions of specific problems

Wendy Smith **Ocean Health Xprize** –

1 M \$ prize money, <http://oceanhealth.xprize.org/>

Measuring the acidification of the oceans

End-user Contacts

End-user contacts are essential for sensor development due to:

- Input on the demands and needs on the sensor technology of the end-user
- Point to the possibilities of sensor technology for the end-user