



# COST

European Network on New Sensing Technologies for Air  
Pollution Control and Environmental Sustainability - *EuNetAir*

COST Action TD1105

**WGs and MC Meeting at Rome, 4-6 December 2012**

Action Start date: 01/07/2012 - Action End date: 30/06/2016

Year: 2012-2013 (*Starting Action*)



**Linköpings universitet**

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Postdoc in the research group of Prof. Anita Lloyd-Spetz  
(Action Vice-Chair)

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# Research activities

- **Scientific background:**

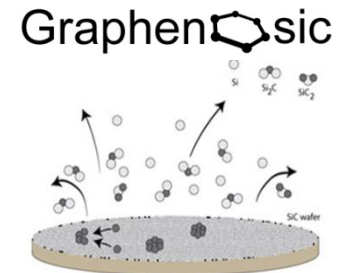
- PhD in nanoscience, heavy focus on non-ideal electronic transport at SiC semiconductor device interfaces

Postdoc activities:

- GraphenSiC AB, surface probe characterization for studying graphene growth mechanisms
- SenSiC AB, graphene on SiC for NO<sub>x</sub> sensors

- **In the Action:**

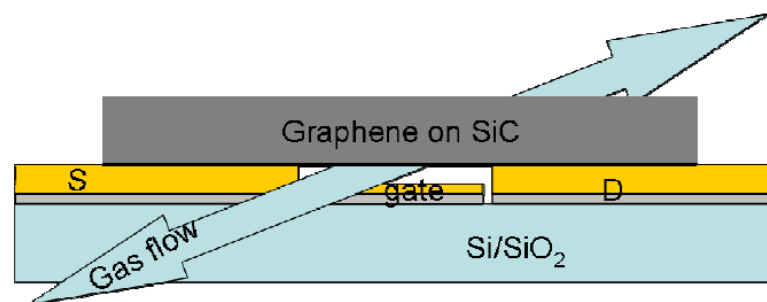
- SiC/graphene sensors
- Graphene functionalization (response time, selectivity)
- Detection mechanisms/gas interactions with graphene
- Graphene FET design and development



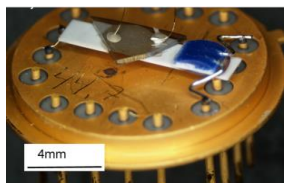
# Current research activities

- NO<sub>2</sub>/NO detection at RT (AQC) and in high-temperature (150-600°C), harsh environments (motor industry, power plants, boilers).
- Brief list of ongoing research topics:
  - ❑ Graphene on SiC sensing mechanisms
  - ❑ Development of graphene-based FET sensor
  - ❑ Improving selectivity, response time, stability

## SenSiC AB patent application

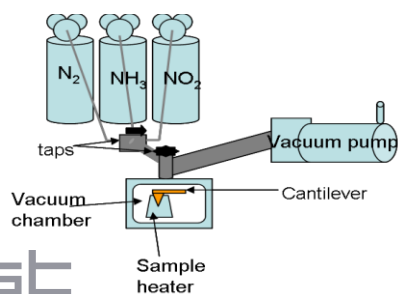


## Graphene sensors

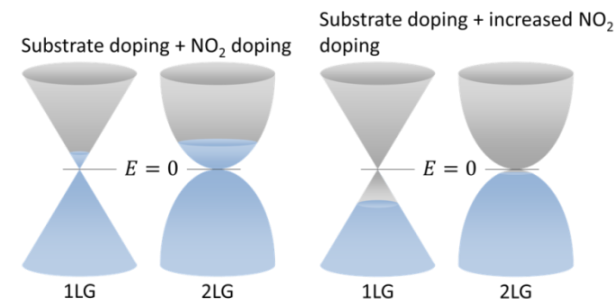
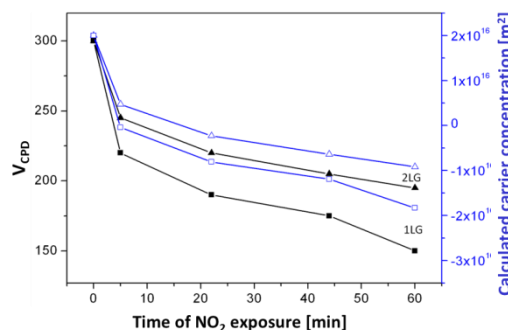


Detects < 10 ppb NO<sub>2</sub>

## Environmental SKPM: gas sensitivity for different layer thicknesses

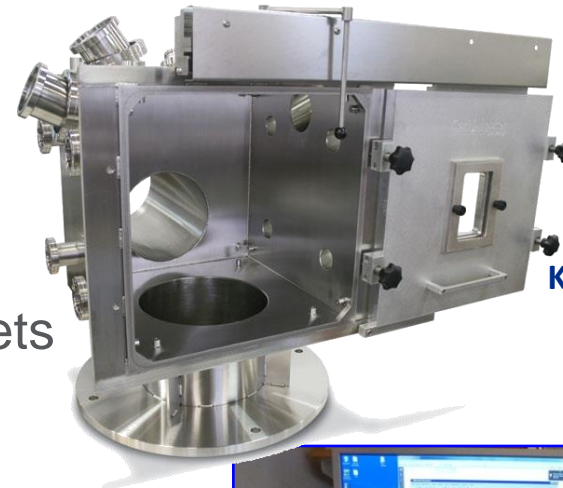


## Differing gas sensitivity for 1LG and 2LG



# Research Facilities

- Gas mixing systems, 8 gas regulators, software for control and data collection
- Electronics and software for operation of gas sensors based on FET devices or resistive type sensors from RT to +800°C
- Environmental mass spectrometer
- Environmental Kelvin probe
- Environmental SPM
- Sputtering system with 3 simultaneous targets
- Evaporation system
- Bonding machine
- Surface welding machine
- Scriber



**Kelvin probe and mass spectrometry in environmental (vacuum) chamber**

