



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

COST Action TD1105

1ST TRAINING SCHOOL

Universitat de Barcelona, Spain, 13 - 15 June 2013

organized by UB, MIND-IN2UB - Dept. of Electronics and CSIC-IDAEA

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

Year 1: 2012 - 2013 (*Ongoing Action*)



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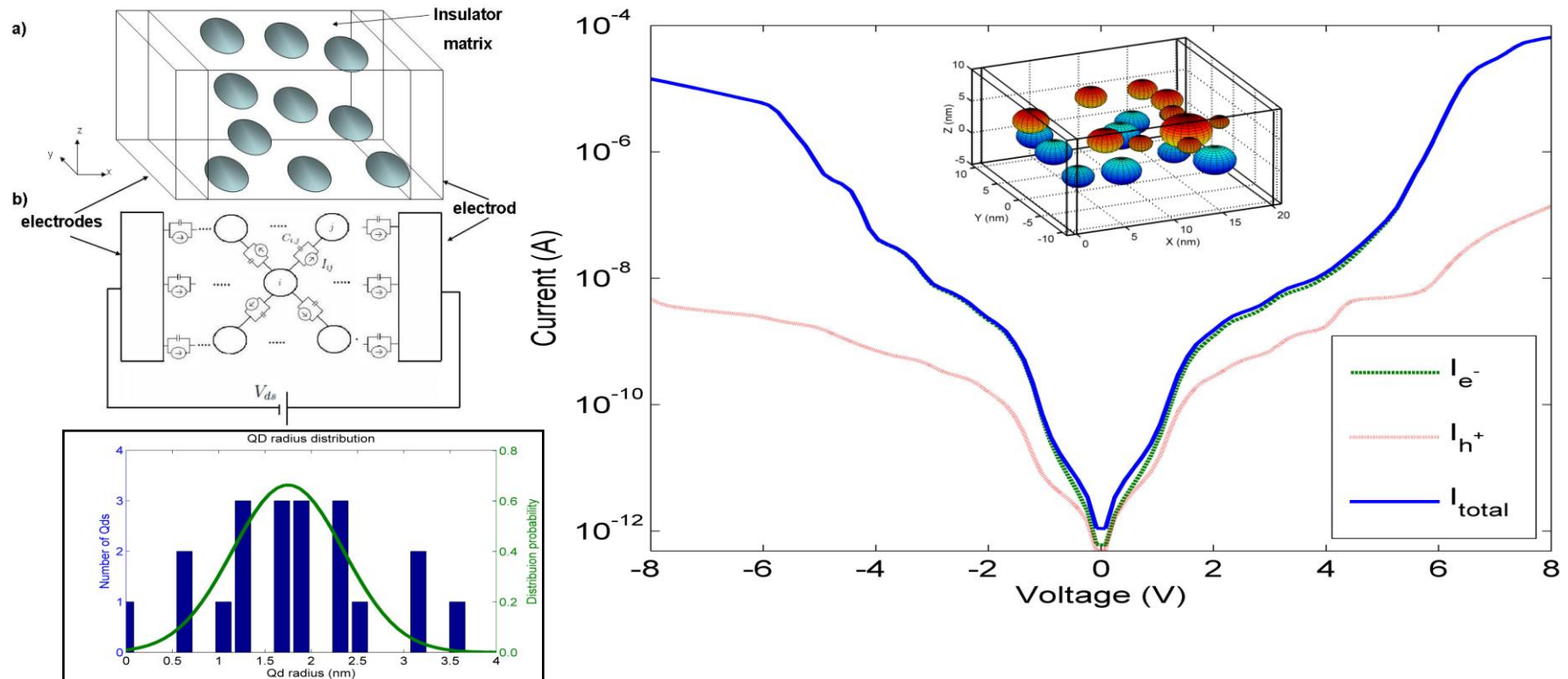


Expertise of the Trainee

- **Computational skills:**
 - **MATLAB (parallel works)**
 - **PYTHON**
 - **JAVA**
 - **MATHEMATICA**
 - **MareNostrum BSC-CNS user**

Current research activities

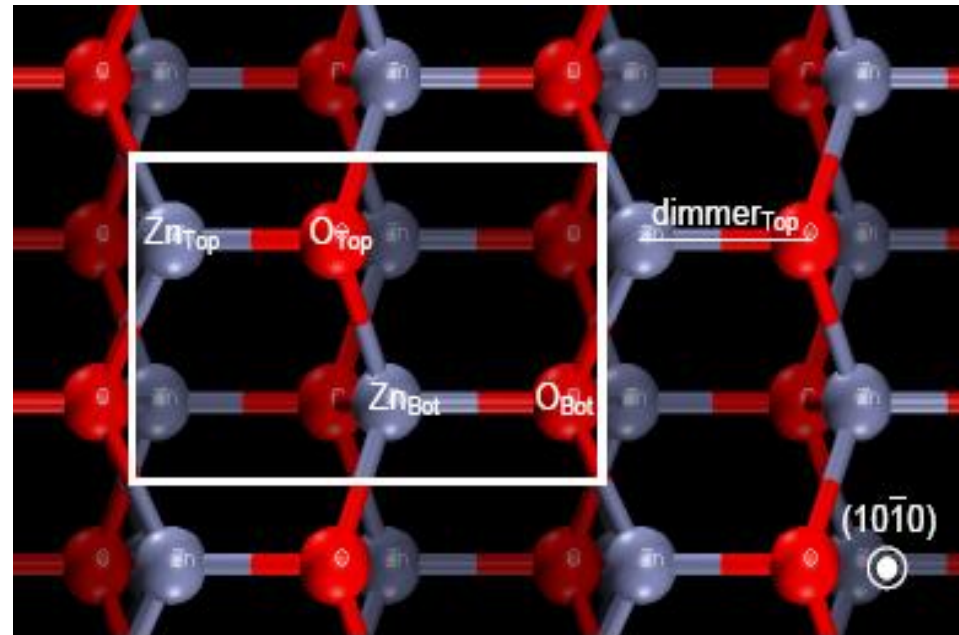
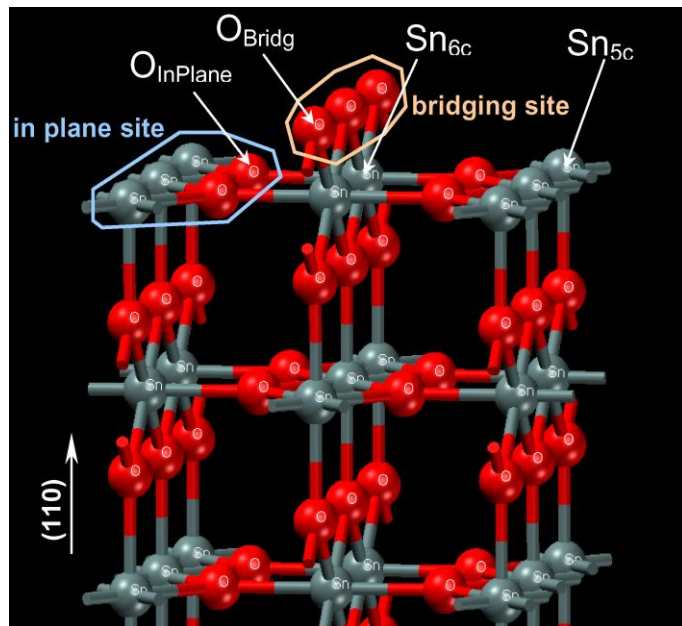
- Carrier transport models \longrightarrow Computational implementation
 - Electrical response simulation of devices based on quantum dots



- Device applications (transistor, photo-detector, bilayer structure...)

Current research activities

- Dynamic of the gas sensor response
 - Structural properties
 - Surface characteristics



- DFT calculations

- **Electronic transport model for quantum dots**

Illera S., Prades J. D., Cirera A. and Cornet A. EPL 98 17003 (2012).

Illera S., Garcia-Castello N., Prades J. D. and Cirera A. J. Appl. Phys. 112 093701 (2012)

Illera S., Prades J. D., Cirera A. and Cornet A. ArXiv e-prints (Preprint 1207.5513) (2012)

Illera S., Prades J. D., and Cirera A. ArXiv e-prints (Preprint 1305.3612) (2013)

- **Starting: DFT simulations & gas sensor dynamics**

- **Thermoelectric simulations in nanostructures**

CONCLUSIONS

- Topics of research, from a fundamental point of view:
- Electronic transport
- Nanostructures
- Materials
- Gas sensor
- Thermoelectric