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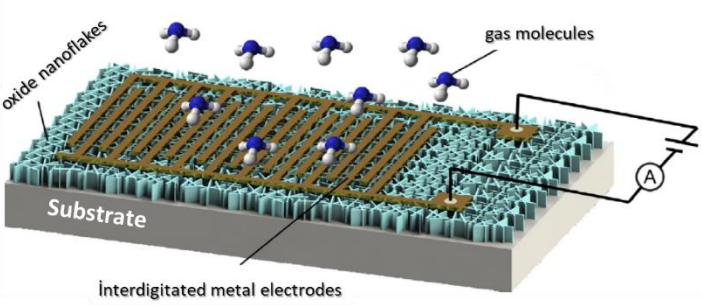
(Vacancies for MSc)

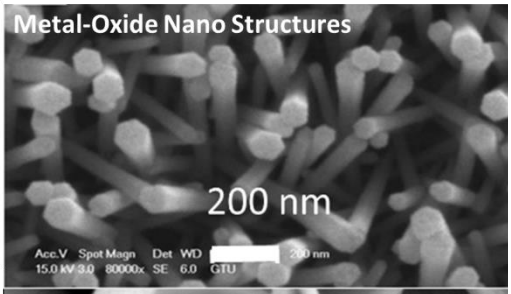
Department of Physics

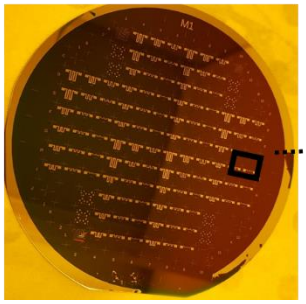
GEBZE TECHNICAL UNIVERSITY
Department of Physics

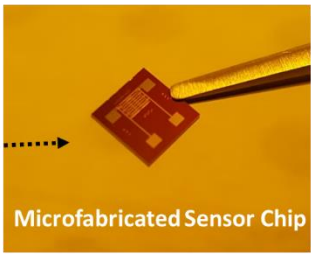
Title: *Development of NH_3 Sensor Prototypes with Hetero Structures Based on Carbon Nanomaterials Functionalized by Atomic Layer Deposition Method.*

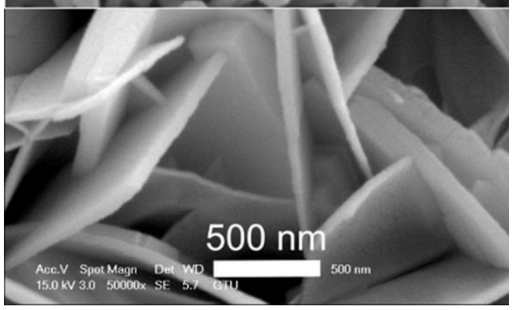
Coordinator: *Assoc. Prof. Serkan Büyükköse*











Goal and motivation

Chemiresistive type gas sensors have been intensively used for detection of different type of gasses at concentration levels ranging from ppm to ppb concentrations. This type of sensors have advantage of high sensitivity, low-cost and real time measurement. Moreover, its compatibility with modern micro-nano fabrication methods enables miniaturization of sensor devices for portable applications.

Semiconductor Metal Oxide (SMO) materials have been intensively used in chemiresitive sensor platforms as sensing material. Charge transfer between target gas molecules and sensing layer alters electrical properties of the surface and appears as a change in conductivity which turns into sensor signal.

In this project, we aim to fabricate high sensitive and selective gas sensors by using hetero structures of SMO/Carbon Nano Materials. As a target gas amonia is choosen which is known as biomarkers for kidney diseases and needs to be monitored in some indoor environments.This project will be carried out as a part of a sub-project under NANOSİS platform managed by Sabancı University Nanotechnology Research and Application Center (SUNUM).

The assignment

- *The project will consist of 4 work packages;*
    1. *Synthesis and structural characterization of sensing materials (Gebze Technical University)*
    2. *Microfabrication of transducers chips (SUNUM)*
    3. *Electrical measurements and performance tests of the sensors in a calibrated gas measurement system (Gebze Technical University)*
    4. *Development of sensor systems adapted to bathroom systems (Eczacıbaşı Building Products)*

- *MSc candidate will be mainly involved in WP1 and WP3. However, there will be very close collaboration between other partners managing WP2 and WP4.*

- *WP1 and WP3 will involve sample preparation by Atomic Layer Deposition (ALD), hydrothermal method, RF sputtering and thermal evaporation; structural and compositonal characterization, electrical and sensor measurements, and data interpretation. The electrical characterization and sensor measurements will be performed with a home-made computer controlled gas sensing system. The student and researchers are encouraged to actively participate in all these aspects.*

- *This project is financed by* the Scientific and Technological Research Council of Turkey (TÜBİTAK) 1004 program.

Profile

Candidates with preferential background in physics, material science and electrical engineering are encouraged to apply. Candidates are expected to be enrolled in master program at GTU.

Graduate Study in the Department of Physics

As a master student in Physics Department you are a full group member and expected to give an active contribution to ongoing research. You are involved in all aspects of research (device fabrication, measurements and analysis) and your work is likely to be part of a scientific publication. Besides, you are also encouraged to participate in the regular social activities.

Project Website

https://nanosisplatform.net/proje-4-3/

Information and Application

Are you interested in this position? Please send your application via e-mail and include:

- CV (resume)
- A motivation letter
- List of publications (for postdoc applicants)

Scholarships will be paid within the upper limits determined by TÜBİTAK.
For more information regarding this position, you are welcome to contact Assoc. Prof. Dr. Serkan Büyükköse via sbuyukkose@gtu.edu.tr