

Marie Skłodowska Curie Individual Fellowship 2020

Expression of Interest for hosting Marie Curie Fellows

1. Supervisor (name and e-mail address)

Elisabetta Comini
email: elisabetta.comini@unibs.it

2. Department (name and address)

Dipartimento di Ingegneria dell'Informazione
Department of Information Engineering
via Branze 38, I-25123 Brescia, Italy

3. Panel (choose one)

X Chemistry (CHEM)
 Social Sciences and Humanities (SOC)
 Economic Sciences (ECO)
 Information Science and Engineering (ENG)
 Environment and Geosciences (ENV)
 Life Sciences (LIF)
 Mathematics (MAT)
X Physics (PHY)

4. Description of your research activities (max 10 lines)*

The research activity of SENSOR Laboratory (<http://sensor.unibs.it>) is focused on the preparation and characterization of nanostructured materials in forms of films, nanowires, 1- and 2- dimensional morphologies and heterostructures. We were pioneers in the field of 1D chemical and gas sensing, and nowadays we are investigating functionalized metal oxides, hybrid composites and heterostructures for their integration in functional devices, such as chemical sensors, gas sensors, catalysts, thermoelectric devices and others, on conventional and novel substrates like MEMS, paper, bio-substrates and flexible polymers. We are studying these novel materials and structures to address the challenges in environmental and food quality monitoring. We have different techniques for materials preparation (sputtering, evaporation, thermal oxidation, hydrothermal synthesis, electrochemical anodization) and for their characterization (SEM-FEG, XRD, AFM, UV-VIS, Kelvin probe, gas test facilities, IPCE, nanoRaman, SNOM, TERS).

5. Key-words

Nanomaterials, heterostructures, hybrid composites, metal oxides, chemical sensors, gas sensors, flexible sensors, wearable sensors, paper-based devices

6. Short CV of the supervisor (max 5 lines)

Elisabetta Comini (M.S in Physics, PhD Materials Eng.) is full professor of experimental physics @ University of Brescia. EC is a specialist in the synthesis and characterization of electronic, functional and structural properties of metal oxides, particularly nanowires, heterostructures, hybrids, thin films. EC is the director of SENSOR laboratory (<http://sensor.unibs.it>), and her high productivity is confirmed by the high number of publications on international journals (>360) and invited and plenary presentations at conferences. Her h-index is 52 (Web of Science), 54 (Scopus), 64 (Google scholar). Researcher ID <http://www.researcherid.com/rid/C-6721-2008> ORCID <http://orcid.org/0000-0003-2559-5197> Google scholar: <http://scholar.google.it/citations?user=2ZAnRXwAAAAJ&hl=en>

7. List of 5 main publications of the supervisor

- Stable and highly sensitive gas sensors based on semiconducting oxide nanobelts **Comini, E**; Faglia, G; Sberveglieri, G; Pan, ZW; Wang, ZL *APPLIED PHYSICS LETTERS* SEP 2 2002, 81, 10, 1869, DOI: 10.1063/1.1504867 **1238 citations**
- Quasi-one dimensional metal oxide semiconductors: Preparation, characterization and application as chemical sensors **Comini, E.**; Baratto, C.; Faglia, G.; Ferroni, M.; Vomiero, A.; Sberveglieri, G. *Progress on Material Science* 2009 54 p1 DOI: 10.1016/j.pmatsci.2008.06.003 **455 citations**
- Metal oxide nanowire chemical sensors: innovation and quality of life **Comini, E.** *MATERIALS TODAY* Volume: 19 Issue: 10 p 559-567 DOI: 2016 10.1016/j.mattod.2016.05.016 **54 citations**
- Branch-like NiO/ZnO heterostructures for VOC sensing Kaur, N; Zappa, D; Ferroni, M; Poli, N; Campanini, M; Negrea, R; **Comini, E** *SENSORS AND ACTUATORS B-CHEMICAL* 2018 262 p477 DOI: 10.1016/j.snb.2018.02.042 **31 citations**
- Sensing Nitrogen Mustard Gas Simulant at the ppb Scale via Selective Dual-Site Activation at Au/Mn3O4 Interfaces Bigiani, Lorenzo; Zappa, Dario; Barreca, Davide; **Comini, E.** et al. *ACS APPLIED MATERIALS & INTERFACES* 11 26 23692-23700 2019 DOI: 10.1021/acsami.9b04875

*Please consider that the preparation of a Marie Curie proposal requires some time. Fellow and supervisor have to agree on a project and training opportunities for the fellow.