

CURRICULUM VITAE

EUROPEAN FORMAT

PERSONAL INFORMATION

Name, Surname	Mauro Salvatore Epifani
Address House number, street name, postcode, city, country	
Telephone	+390832299775
Fax	+390832422550
E-mail	mauro.epifani@le.imm.cnr.it
Website	http://www.imm.cnr.it/
Nationality	Italian
Place and Date of birth	Mesagne (Br), Italy, 04/01/1970

WORK EXPERIENCE

Dates (from – to)	28/12/2001-current
Name and address of employer	Consiglio Nazionale delle Ricerche
Type of business or sector	Research
Occupation or position held	Full Time Researcher
Main activities and responsibilities	Responsible of the Chemical Synthesis of Advanced Materials
Dates (from – to)	April 2000 - 26/12/2001
Name and address of employer	Università degli Studi di Lecce
Type of business or sector	Research
Occupation or position held	Research Fellowship (Assegno di Ricerca)
Main activities and responsibilities	Chemical Synthesis of Advanced Materials, Advanced Techniques of Materials Characterization

EDUCATION AND TRAINING

Dates (from – to)	1 November 1996 – February 2000
Name and type of organisation providing education and training	Università degli Studi di Lecce (University)
Principal subjects occupational skills covered	<ul style="list-style-type: none">- Chemical synthesis of oxide thin films by wet chemical approaches;- Chemical synthesis of noble metal nanocrystals in inorganic host by sol-gel process;- Materials characterization (UV-vis absorption, FT-IR, XPS, Auger, X-ray Diffraction, Transmission Electron Microscopy, Scanning Electron Microscopy);- Application of nanocrystals to gas-sensing devices;
Title of qualification awarded	PhD in Physics
Level in National classification	Dottorato di Ricerca/PhD

Dates (from – to)	1988-1996
Name and type of organisation providing education and training	Università degli Studi di Lecce (University)
Principal subjects occupational skills covered	Solid state physics, semiconductor physics, materials science, chemical synthesis of advanced materials.
Title of qualification awarded	MSc in Physics (Laurea)
Level in National classification	Laurea (MSc)

RESEARCH ACTIVITIES

Research sectors	<ul style="list-style-type: none"> - Chemical synthesis of inorganic nanocrystals by means of colloidal approaches (sol-gel, metalorganic decomposition, coordinating surfactants); - Chemical synthesis of oxide thin films by wet chemical approaches; - Advanced characterization of nanomaterials; - Application of nanocrystals in gas-sensing devices; - Application of nanocrystals in photocatalytic systems
Recent Scientific Activities	<p>Chemical synthesis of TiO₂ and complex TiO₂-V₂O₅ and TiO₂-WO₃ nanocrystals by means of colloidal approaches (solvothermal processing);</p> <ul style="list-style-type: none"> - Chemical synthesis of Co nanocrystals by decomposition of 2-ethylhexanoates; - Advanced characterization of TiO₂-V₂O₅ nanomaterials for investigating the growth mechanisms; -Coordination of Italy-Spain joint CNR-CSIC project; - 16 Invited Talks to International scientific congresses since January 2012; -Participation to Italian projects SOLAR and Innovasol for synthesis and industrial applications of nanofluids in solar concentrator systems;

Publications

JCR Journals:

1. G. De, M. Epifani, A. Licciulli "Copper ruby monoliths by the sol gel process", *Journal of Non-Crystalline Solids* 201 (1996) 250-255.
2. F. Quaranta, R. Rella, P. Siciliano, L. Vasanelli, M. Epifani, A. Licciulli "A novel gas sensor based on SnO₂/Os thin film for the detection of methane at low temperature" *Sens. Actuators B* 58 (1999) 350-355.
3. S. Capone, R. Rella, P. Siciliano, L. Vasanelli, M. Epifani, A. Licciulli "Air quality monitoring by means of sol-gel integrated tin oxide thin films" *Sens. Actuators B* 58 (1999) 283-288.
4. R.Rella, P. Siciliano, L. Vasanelli, A. Licciulli, M. Epifani "Response of SnO₂ thin film sensor to the flavours of parmesan cheese" *Sensors and Materials* 12 (2000) 109-115.
5. F. Quaranta, R. Rella, P. Siciliano, S. Capone, M. Epifani, L. Vasanelli "Analysis of vapours and foods by means of an electronic nose based on a sol-gel metal oxide sensors array" *Sens. Actuators B* 69 (2000) 230-235.
6. M. Epifani, C. Giannini, L. Tapfer, L. Vasanelli "Sol-Gel Synthesis and Characterization of Ag and Au Nanoparticles in SiO₂, TiO₂ and ZrO₂ Thin Films", *J. Am. Ceram. Soc.* 83 (2000), 2385-2393.
7. S. Capone, M. Epifani, F. Quaranta, P. Siciliano, L. Vasanelli "Application of a semiconductor sol-gel sensor array to the discrimination of pollutant in air", *Thin Solid*

Films 391 (2001) 314.

8. P. Siciliano, F. Quaranta, R. Rella, S. Capone, M. Epifani, L. Vasanelli "Moisture influence and geometry effect of Au and Pt electrodes on CO sensing response of SnO₂ microsensors based on sol-gel thin films" *Sensors and Actuators B* 77 (2001) 503-511.
9. P. Siciliano, S. Capone, M. Epifani, F. Quaranta, L. Vasanelli "Monitoring of rancidity of milk by means an electronic nose and dynamic PCA analysis", *Sensors and Actuators B* 78, (2001) 174-179.
10. M. Epifani, M. Alvisi, L. Mirengi, G. Leo, P. Siciliano, L. Vasanelli "Sol-Gel Processing and Characterization of Pure and Metal Doped SnO₂ Thin Films", *J. Am. Ceram. Soc.* 84 (2001) 48-54.
11. M. Epifani, E. Carlino, C. Blasi, C. Giannini, L. Tapfer, L. Vasanelli "Sol-Gel Processing of Au Nanoparticles in Bulk 10%B₂O₃-90%SiO₂ Glass", *Chem. Mater.* 13 (2001) 1533-1539.
12. M. Epifani, G. De, A. Licciulli, L. Vasanelli "Preparation of uniformly dispersed copper nanocluster doped silica glasses by the sol-gel process", *J. Mater. Chem.* 11 (2001) 3326-3332.
13. F. Quaranta, R. Rella, P. Siciliano, S. Capone, C. Distante, M. Epifani, A. Taurino "Preparation and Characterization of Nanostructured Materials for an Artificial Olfactory Sensing System" *Sens. Actuators B* 84 (2002) 55-59.
14. A. Taurino, S. Capone, C. Distante, M. Epifani, R. Rella, P. Siciliano "Recognition of olive oils by means of an integrated sol-gel SnO₂ Electronic Nose" *Thin Solid Films* 418 (2002) 59-65.
15. M. Epifani, G. Leo, M. Lomascolo, L. Vasanelli, L. Manna "Sol-Gel Synthesis Of Hybrid Organic-Inorganic Monoliths Doped With Size-Selected CdSe-ZnS Core-Shell Nanoparticles", *J. Sol-Gel Sci-Techn.* 26 (2003) 441-446.
16. M. Epifani, S. Capone, R. Rella, P. Siciliano, L. Vasanelli, G. Faglia, P. Nelli, G. Sberveglieri "In₂O₃ Thin Films Obtained Through a Chemical Complexation Based Sol-Gel Process and Their Application as Gas Sensor Devices", *J. Sol-Gel Sci-Techn.* 26 (2003) 741-744.
17. A. M. Taurino, M. Epifani, T. Toccoli, S. Iannotta, P. Siciliano "Innovative aspects in thin film technologies for nanostructured materials in gas sensor devices", *Thin Solid Films* 436 (2003) 52.
18. A. M. Taurino, D. Dello Monaco, S. Capone, M. Epifani, R. Rella, P. Siciliano, L. Ferrara, G. Maglione, A. Basso, D. Balzarano "Analysis of dry salami by means of an electronic nose and correlation with microbiological methods", *Sens. Actuators B* 95 (2003) 123-131.
19. M. Epifani, A. Forleo, S. Capone, F. Quaranta, R. Rella, P. Siciliano, L. Vasanelli "Hall Effect Measurements in Gas Sensors Based on Nanosized Os-Doped sol-gel Derived SnO₂ Thin Films", *IEEE Sensors Journal* 3 (2003) 827-834.
20. A. Forleo, S. Capone, M. Epifani, P. Siciliano, R. Rella "Role of osmium in the electrical transport mechanism of polycrystalline tin oxide thin film", *Appl. Phys. Lett.*, 84 (2004) 744-746.

21. M. Epifani, P. Siciliano, A. Gurlo, N. Barsan, U. Weimar "Ambient Pressure Synthesis of Corundum Type In_2O_3 ", *J. Am. Chem. Soc.* 126 (2004) 4078-4079.
22. M. Epifani, C. Giannini, L. Manna "A Novel Synthesis of CdSe Nanocrystals", *Mater. Lett.* 58 (2004) 2429-2432.
23. M. Epifani, P. Imperatori, L. Mirengi, M. Schioppa, P. Siciliano "Synthesis and Characterization of MoO_3 Thin Films and Powders from a Mo Chloro-Methoxide", *Chem. Mater.* 16 (2004) 5495-5501.
24. S. Nardis, D. Monti, C. Di Natale, A. D'Amico, P. Siciliano, A. Forleo, M. Epifani, A. Taurino, R. Rella, R. Paolesse "Preparation and characterization of Cobalt Porphyrin modified Tin Dioxide films for sensor applications", *Sens. Actuators B* 103 (2004) 339-343.
25. M. Epifani, E. Carlino, D. Furlanetto, C. Giannini, P. Imperatori "Synthesis of Gold Nanocrystals in Concurrently Polymerizing Organic-Inorganic Hybrid Films", *J. Mater. Res.* 20 (2005) 1287-1294.
26. L. Francioso, D. S. Presicce, M. Epifani, P. Siciliano, A. Ficarella "Response evaluation of TiO_2 sensor to flue gas on spark ignition engine and in controlled environment", *Sens. Actuators B* 107 (2005) 563-571.
27. D. S. Presicce, L. Francioso, M. Epifani, P. Siciliano, A. Ficarella "Temperature and doping effects on performance of titania thin film lambda probe", *Sens. Actuators B* 111-112 (2005) 52-57.
28. A. Forleo, L. Francioso, M. Epifani, S. Capone, A. M. Taurino, P. Siciliano "NO₂ gas-sensing properties of mixed In_2O_3 - SnO_2 thin films", *Thin Solid Films* 490 (2005) 68-73.
29. M. Epifani, J. Arbiol, R. Diaz, M. J. Peralvarez, P. Siciliano, J. R. Morante "Synthesis of SnO_2 and ZnO Colloidal Nanocrystals from the Decomposition of Tin(II) 2-Ethylhexanoate and Zinc(II) 2-Ethylhexanoate" *Chem. Mater.* 17 (2005) 6468-72.
30. L. Francioso, A. Forleo, S. Capone, M. Epifani, A. M. Taurino, P. Siciliano "Nanostructured In_2O_3 - SnO_2 sol-gel thin film as material for NO₂ detection", *Sensors and Actuators B* 114 (2006) 646-655.
31. A. Cimato, D. Dello Monaco, C. Distanto, M. Epifani, P. Siciliano, A. M. Taurino, M. Zuppa, G. Sani "Analysis of single-cultivar extra virgin olive oils by means of an Electronic Nose and HS-SPME/GC/MS methods", *Sens. Actuators B* 114 (2006) 674-680.
32. M. Epifani, J. Arbiol, R. Diaz, P. Siciliano, J. R. Morante "Solution Synthesis of Thin Films in the SnO_2 - In_2O_3 System: A Case Study of the Mixing of Sol-Gel and Metal-Organic Solution Processes", *Chem. Mater.* 18 (2006) 840-846.
33. S. Capone, M. Epifani, L. Francioso, S. Kaciulis, A. Mezzi, P. Siciliano, A. M. Taurino "Influence of electrodes ageing on the properties of the gas sensors based on SnO_2 ", *Sens. Actuators B* 115 (2006) 396-402.
34. M. Epifani, R. Díaz, J. Arbiol, E. Comini, N. Sergent, T. Pagnier, P. Siciliano, G. Faglia, J. R. Morante "Nanocrystalline Metal Oxides from the Injection of Metal Oxide Sols in Coordinating Solutions: Synthesis, Characterization, Thermal Stabilization, Device Processing and Gas-Sensing Properties", *Adv. Funct. Mater.* 16 (2006) 1488-1498.
35. M. Epifani, E. Comini, R. Díaz, J. Arbiol, P. Siciliano, G. Sberveglieri, J. R. Morante

- "Oxide Nanopowders from the Low-Temperature Processing of Metal Oxide Sols and Their Application as Gas-Sensing Materials", *Sens. Actuators B* 118 (2006) 105-109.
36. A. Forleo, A. M. Taurino, S. Capone, M. Epifani, L. Francioso, J. Spadavecchia, P. Siciliano "Design of an Electronic Nose for Selective Phosphine Detection in Cereals", *Sensor Letters* 4 (2006) 229-234.
 37. N. Sargent, M. Epifani, T. Pagnier "In-Situ Raman Spectroscopy Study of NO₂ Adsorption onto Nanocrystalline Tin (IV) Oxide", *J. Raman Spectrosc.* 37 (2006) 1272-1277.
 38. N. Cioffi, L. Traversa, N. Ditaranto, A. M. Taurino, M. Epifani, P. Siciliano, T. Blev-Zacheo, L. Sabbatini, L. Torsi, P. G. Zambonin "Core-shell Pd nanoparticles embedded in SnO_x films. Synthesis, analytical characterization and perspective application in chemiresistor-type sensing devices", *Microelectronics Journal* 37 (2006) 1620-1628.
 39. M. Epifani, L. Francioso, P. Siciliano, A. Helwig, G. Mueller, R. Díaz, J. Arbiol, J. R. Morante "SnO₂ thin films from metalorganic precursors: Synthesis, characterization, microelectronic processing and gas-sensing properties", *Sens. And Actuators B* 124 (2007) 217-226.
 40. M. Epifani "Inorganic sols as precursors to the low temperature synthesis of nanocrystalline oxides", *Mater. Lett.* 61 (2007) 3100-3102.
 41. M. Epifani, E. Melissano, G. Pace, M. Schioppa "Precursors for the combustion synthesis of metal oxides from the sol-gel processing of metal complexes", *J. Eur. Ceram. Soc.* 27 (2007) 115-123.
 42. M. Epifani, R. Díaz, J. Arbiol, E. Comini, N. Sargent, T. Pagnier, P. Siciliano, G. Faglia, J. R. Morante "Oxide Nanocrystals from a Low-Temperature, Self-Limiting Sol-Gel Transition in a Coordinating Environment: Synthesis, Processing of Gas-Sensing Devices and Application to Organic Compounds", *Sens. Actuators B* 126 (2007) 163-167.
 43. N. Sargent, M. Epifani, E. Comini, G. Faglia, T. Pagnier "Interactions of nanocrystalline tin oxide powder with NO₂: A Raman spectroscopic study", *Sens. Actuators B* 126 (2007) 1-5.
 44. M. Epifani, E. Comini, J. Arbiol, E. Pellicer, P. Siciliano, G. Faglia, J. R. Morante "Nanocrystals as Very Active Interfaces: Ultrasensitive Room-Temperature Ozone Sensors with In₂O₃ Nanocrystals Prepared by a Low-Temperature Sol-Gel Process in a Coordinating Environment", *J. Phys. Chem. C* 111 (2007) 13967-13971.
 45. M. Epifani, J. Arbiol, E. Pellicer, J. R. Morante "Growth of CdSe Nanocrystals by a Catalytic Redox Activation of Ostwald Ripening: a Case Study of the Concept of Traveling Solubility Perturbation" *Chem. Mater.* 19 (2007) 4919-4924.
 46. M. Epifani, E. Comini, J. Arbiol, R. Díaz, N. Sargent, T. Pagnier, P. Siciliano, G. Faglia, J. R. Morante "Chemical Synthesis of In₂O₃ Nanocrystals and Their Application in Highly Performing Ozone-Sensing Devices" *Sens. Actuators, B* 130 (2008) 483-487.
 47. E. Callone, G. Carturan, M. Ischia, M. Epifani, A. Forleo, P. Siciliano, R. Paolesse "The hydrolytic route to Co-porphyrin-doped SnO₂ gas-sensing materials: Chemical study of Co-porphyrin versus Sn(IV) oxide interactions", *Inorg. Chim. Acta* 361 (2008) 79-85.
 48. M. Epifani, L. Francioso, P. Siciliano, A. Helwig, G. Mueller, R. Díaz, J. Arbiol, J. R.

- Morante "TiO₂ thin films from titanium butoxide: synthesis, Pt addition, structural stability, microelectronic processing and gas-sensing properties" *Sens. Actuators, B* 130 (2008) 599-608.
49. M. Epifani, J. Arbiol, T. Andreu, J. R. Morante "Synthesis of soluble and size controlled SnO₂ and CeO₂ nanocrystals: application of a general concept for the low temperature, hydrolytic synthesis of organically capped oxide nanoparticles" *Eur. J. Inorg. Chem.* (2008) 859-862.
 50. M. Epifani, J. Arbiol, E. Pellicer, E. Comini, P. Siciliano, G. Faglia, J. R. Morante "Synthesis and gas-sensing properties of Pd-doped SnO₂ nanocrystals. A case study of a general methodology for doping metal oxide nanocrystals" *Cryst. Growth Des.* 8 (2008) 1774-1778.
 51. M. Epifani, E. Pellicer, J. Arbiol, N. Sergent, T. Pagnier, J. R. Morante "Capping Ligand Effects on the Amorphous-to-Crystalline Transition of CdSe Nanoparticles" *Langmuir* 24 (2008) 11182-11188.
 52. M. Epifani, J. D. Prades, E. Comini, E. Pellicer, M. Avella, P. Siciliano, G. Faglia, A. Cirera, R. Scotti, F. Morazzoni, J. R. Morante "The Role of Surface Oxygen Vacancies in the NO₂ Sensing Properties of SnO₂ Nanocrystals" *J. Phys. Chem. C* 112 (2008) 19540-19546.
 53. M. Epifani, E. Pellicer, J. Arbiol, Joan R. Morante "Metal Oxide Nanocrystals from the Injection of Metal Oxide Sols in a Coordinating Environment: Principles, Applicability, and Investigation of the Synthesis Variables in the Case Study of CeO₂ and SnO₂" *Chem. Mater.* 21 (2009) 862-870.
 54. M. Epifani, T. Andreu, C. R. Magana, J. Arbiol, P. Siciliano, M. D'Arienzo, R. Scotti, F. Morazzoni, J. R. Morante "The Chloroalkoxide Route to Transition Metal Oxides. Synthesis of V₂O₅ Thin Films and Powders from a Vanadium Chloromethoxide" *Chem. Mater.* 21 (2009) 1618-1626.
 55. M. Epifani, J. D. Prades, E. Comini, A. Cirera, P. Siciliano, G. Faglia, J. R. Morante "Chemoresistive sensing of light alkanes with SnO₂ nanocrystals: a DFT- based insight" *PCCP* 11 (2009) 3634-3639.
 56. A. P. Caricato, M. Epifani, M. Martino, F. Romano, R. Rella, A. Taurino, T. Tunno, D. Valerini "MAPLE deposition and characterization of SnO₂ colloidal nanoparticle thin films" *J. Phys. D: Appl. Phys.* 42 (2009) 095105.
 57. M. Epifani, T. Andreu, J. Arbiol, R. Díaz, P. Siciliano, J. R. Morante "Chloro-Alkoxide Route to Transition Metal Oxides. Synthesis of WO₃ Thin Films and Powders from a Tungsten Chloro-Methoxide" *Chem. Mater.* 21 (2009) 5215-5221.
 58. M. Epifani, J. Arbiol, R. Díaz, T. Andreu, P. Siciliano, J. R. Morante, "Morphological and structural characterization of WO₃ and Cr-WO₃ thin films synthesized by sol-gel process" *Thin Solid Films* 518 (2010) 4512-4514.
 59. M. Epifani, T. Andreu, C. R. Magaña, R. Díaz, J. Arbiol, P. Siciliano, J. R. Morante "From doping to phase transformation: Ammonia sensing performances of chloroalkoxide-derived WO₃ powders modified with chromium" *Sens. Actuators B* 148 (2010) 200-206.
 60. M. Epifani, J. Arbiol, E. Pellicer, N. Sergent, T. Pagnier, J. R. Morante "Synthesis and

- structural properties of ultra-small oxide (TiO₂, ZrO₂, SnO₂) nanoparticles prepared by decomposition of metal alkoxides" *Mater. Chem. Phys.* 124 (2010) 809-815.
61. M. Epifani, J. Arbiol, T. Andreu, J. R. Morante "Crystallization Pathways of Multicomponent Oxide Nanocrystals: Critical Role of the Metal Cations Distribution in the Case Study of Metal Ferrites" *Cryst. Growth Des.* 10 (2010) 5176-5181.
 62. S. Abdollahzadeh-Ghom, C. Zamani, T. Andreu, M. Epifani, J. R. Morante "Improvement of oxygen storage capacity using mesoporous ceria-zirconia solid solutions" *Appl. Catal. B-Environ.* 108 (2011) 32-38.
 63. M. Epifani, E. Comini, G. Faglia, J. Arbiol, T. Andreu, G. Pace, P. Siciliano, J. R. Morante "Two step, hydrolytic-solvothermal synthesis of redispersible titania nanocrystals and their gas-sensing properties" *J. Sol-Gel Sci. Technol.* 60 (2011) 254-259.
 64. M. Epifani, T. Andreu, R. Zamani, J. Arbiol, E. Comini, P. Siciliano, G. Faglia, J. R. Morante "Pt doping triggers growth of TiO₂ nanorods: nanocomposite synthesis and gas-sensing properties" *CrystEngComm* 2012 (11) 3882-3887.
 65. M. Epifani, T. Chavez-Capilla, T. Andreu, J. Arbiol, J. Palma, J. R. Morante, R. Diaz "Surface modification of metal oxide nanocrystals for improved supercapacitors" *Energy Env. Sci.* 6 (2012) 7555-7558.
 66. M. Epifani, T. Andreu, S. Abdollahzadeh-Ghom, J. Arbiol, J. R. Morante "Synthesis of Ceria-Zirconia Nanocrystals with Improved Microstructural Homogeneity and Oxygen Storage Capacity by Hydrolytic Sol-Gel Process in Coordinating Environment" *Adv. Funct. Mater.* 13 (2012) 2867-2875.
 67. M. Epifani, R. Diaz, C. Force, E. Comini, T. Andreu, R. R. Zamani, J. Arbiol, P. Siciliano, G. Faglia, J.R. Morante "Colloidal Counterpart of the TiO₂-Supported V₂O₅ System: A Case Study of Oxide-on-Oxide Deposition by Wet Chemical Techniques. Synthesis, Vanadium Speciation, and Gas-Sensing Enhancement" *J. Phys. Chem. C* 117 (2013) 20697-20705.
 68. M. Epifani, N. Garcia-Castello, J. D. Prades, A. Cirera, T. Andreu, J. Arbiol, P. Siciliano, J.R. Morante "Suppression of the NO₂ interference by chromium addition in WO₃-based ammonia sensors. Investigation of the structural properties and of the related sensing pathways" *Sens. Actuators, B* 187 (2013) 308-312.
 69. M. Epifani, R. Zamani, J. Arbiol, C. Fabrega, T. Andreu, G. B. Pace, P. Siciliano, J.R. Morante "Soft chemistry routes to transparent metal oxide thin films. The case of sol-gel synthesis and structural characterization of Ta₂O₅ thin films from tantalum chloromethoxide" *Thin Solid Films* 555 (2014) 39-41.
 70. A. León-Reyes, M. Epifani, T. Chávez-Capilla, J. Palma, R. Diaz "Analysis of the different mechanisms of electrochemical energy storage in magnetite nanoparticles" *Int. J. Electrochem. Sci.* 9 (2014) 3837-3845.
 71. M. Epifani, E. Comini, R. Diaz, T. Andreu, A. Genç, J. Arbiol, P. Siciliano, G. Faglia, J. R. Morante "Solvothermal, Chloroalkoxide-based Synthesis of Monoclinic WO₃ Quantum Dots and Gas-Sensing Enhancement by Surface Oxygen Vacancies" *ACS Appl. Mater. Interfaces* 6 (2014) 16808-16816.
 72. M. Epifani, R. Diaz, C. Force, E. Comini, M. Manzanares, T. Andreu, A. Genç, J. Arbiol,

- P. Siciliano, G. Faglia, J. R. Morante "Solvothermal, Surface Modification of TiO₂ Nanocrystals by WO_x Coating or Wrapping: Solvothermal Synthesis and Enhanced Surface Chemistry" *ACS Appl. Mater. Interfaces* 7 (2015) 6898-6908.
73. M. Epifani, E. Comini, R. Diaz, C. Force, P. Siciliano, G. Faglia "TiO₂ colloidal nanocrystals surface modification by V₂O₅ species: Investigation by ⁴⁷Ti,⁴⁹Ti MAS-NMR and H₂, CO and NO₂ sensing properties" *Appl. Surf. Sci.* 351 (2015) 1169-1173.
74. M. Epifani, E. Comini, P. Siciliano, G. Faglia, J. R. Morante "Evidence of catalytic activation of anatase nanocrystals by vanadium oxide surface layer: Acetone and ethanol sensing properties" *Sens. Actuators, B* 217 (2015) 193-197.
75. R. Milan, G. S. Selopal, M. Epifani, M. M. Natile, G. Sberveglieri, A. Vomiero, I. Concina "ZnO@SnO₂ engineered composite photoanodes for dye sensitized solar cells" *Sci. Rep.* 5:14523 (2015).
76. M. Epifani, E. Comini, R. Diaz, A. Genç, T. Andreu, P. Siciliano, J. R. Morante "Acetone Sensors Based on TiO₂ Nanocrystals Modified with Tungsten Oxide Species" *J. Alloys Compd.* 665 (2016) 345-351.
77. M. Epifani, P.-Y. Tang, A. Genç, J. R. Morante, J. Arbiol, R. Diaz, S. Wicker "The ethylhexanoate Route to Metal Oxide Nanocrystals: Synthesis of CoO Nanooctahedra from Co(II) 2-Ethylhexanoate" *Eur. J. Inorg. Chem.* (2016) 3963-3968.

CONFERENCE PROCEEDINGS

78. F. Quaranta, R. Rella, P. Siciliano, L. Vasanelli, M. Epifani, A. Licciulli "Osmium doped SnO₂ thin films for low cost consumption CH₄ sensors", *Proceedings of Eurosensors XII*, edited by Institute of Physics (IOP), ISBN 0 7503 0536 3, Vol. I, 661-664 (1998).
79. S. Capone, R. Rella, P. Siciliano, L. Vasanelli, M. Epifani, A. Licciulli "Pure and doped tin oxide sol-gel thin films for air quality monitoring", *Proceedings of Eurosensors XII*, edited by Institute of Physics (IOP), ISBN 0 7503 0536 3, Vol. I, 613-616 (1998).
80. S. Capone, R. Rella, P. Siciliano, L. Vasanelli, M. Epifani, A. Licciulli "Sensori di gas a semiconduttore per il controllo ambientale", *Proceedings of V National Conference "Strumentazione e metodi di misura elettroottici"*, ELETTRROTTICA '98, Matera, May 1998, 157-161
81. F. Quaranta, R. Rella, P. Siciliano, S. Capone, M. Epifani, L. Vasanelli "Sol-gel tin oxide thin films activated with Pd, Pt and Os and their application for monitoring air pollutants", *Proceedings of Eurosensors XIII*, ISBN 90-76699-01-1, pag. 41 (1999).
82. F. Quaranta, R. Rella, P. Siciliano, S. Capone, M. Epifani, L. Vasanelli "An electronic nose based on a sol-gel metal oxide sensors array", *Proceedings of The 6th International Symposium Olfaction and Electronic Nose*, September 1999, Tübingen, Germany ISBN 3-00-004819-7, pag. 126-129 (1999).
83. S. Capone, R. Rella, P. Siciliano, L. Vasanelli, A. Licciulli, M. Epifani, "Activated tin oxide gas sensors by the sol-gel technology", *Advances in Science and Technology, Solid State Chemical and Biochemical Sensors*, ISBN 88-8653827-8 edited by Techna Srl., 26 (1999)161-168.
84. R. Rella, P. Siciliano, S. Capone, M. Epifani, L. Vasanelli, A. Distante, F. Filograna,

- "Detection of vapours by a sol-gel sensor array", Proceedings of the 4th Italian Conference on Sensors and Microsystems, February 1999, Roma, Italy, in *Sensors and Microsystems*, edited by World Scientific Publ. ISBN 981-02-4199-2, Vol.4, pag. 260-264 (2000).
85. P. Siciliano, R. Rella, L. Vasanelli, S. Capone, M. Epifani, A. Licciulli "Metal oxide gas sensors prepared by sol-gel technology and their application in electronic-nose", in "Proceedings of II° WORKSHOP SENSORI CHIMICI e BIOSENSORI", ISBN 88-8286-072-8, Editors Mazzei and Pilloton, pag. 66-71 (2000).
 86. P. Siciliano, S. Capone, M. Epifani, F. Quaranta, R. Rella, L. Vasanelli "Dynamic PCA analysis to distinguish the rancidity of milk by means of a semiconductor thin films based Electronic Nose", Proceedings of Eurosensors XIV, August 2000, Copenhagen, Denmark, ISBN 87-89935-50-0, pag. 703 (2000).
 87. P. Siciliano, A. Taurino, R. Rella, S. Capone, C. Distante, L. Vasanelli, M. Epifani "Discrimination between commercial and local olive oils by means of an Electronic Nose", in 'Proceedings of 7th International Symposium on Olfaction and Electronic Nose', 2001, editors J. Gardner and K. Persaud, World Scient. Publ., Singapore.
 88. M. Epifani, A. Forleo, S. Capone, R. Rella, F. Quaranta, P. Siciliano, L. Vasanelli "Electrical and gas-sensing properties of nano-sized Os-doped sol-gel derived SnO₂ thin films", Proceedings of the 6th Italian Conference on Sensors and Microsystems, 5th-7th February, 2001, Pisa, Italy, in 'Sensors and Microsystems', edited by World Scientific Publ, 133-138, ISBN: 981-02-4895-4.
 89. S. Capone, M. Epifani, G. Faglia, P. Nelli, R. Rella, G. Sberveglieri, P. Siciliano "Sol-gel synthesis and gas sensing properties of In₂O₃ thin films", Proceedings of the 6th Italian Conference on Sensors and Microsystems, 5th-7th February, 2001, Pisa, Italy, in 'Sensors and Microsystems', edited by World Scientific Publ, 144-149, ISBN: 981-02-4895-4.
 90. S. Capone, C. Distante, M. Epifani, R. Rella, P. Siciliano, A. M. Taurino "Determination of peach physiological indices by an electronic nose and near-infrared spectroscopy", Proceedings ISOEN 2002, 9th International Symposium on "Olfaction and Electronic Nose", Sept 29 - Oct 2, 2002, Rome, Italy.
 91. S. Capone, C. Distante, M. Epifani, R. Rella, P. Siciliano A. Taurino "Analysis of peaches ripeness by an electronic nose and near-infrared spectroscopy", Proceedings of the 7th Italian Conference on Sensors and Microsystems, 4th-6th February, 2002, Bologna, Italy, in 'Sensors and Microsystems', edited by World Scientific Publ, 125-130, ISBN: 981-238-181-3.
 92. R. Paolesse, C. Di Natale, D. Monti, A. Macagnano, A. D'Amico, P. Siciliano, M. Epifani, A. Forleo, A. Taurino, R. Rella "Preparation of novel hybrid sensing materials: porphyrin doped tin dioxide thin films", Proceedings of the 8th Italian Conference on Sensors and Microsystems, 12th-14th February, 2003, Trento, Italy, in 'Sensors and Microsystems', copyright © 2004 by World Scientific Publishing Co. Pte. Ltd., ISBN: 981-238-741-1.
 93. D. Dello Monaco, A.M. Taurino, C. Distante, S. Capone, M. Epifani, P. Siciliano, R. Rella "Electronic nose as a useful tool complementary to conventional techniques for evaluating food quality", Proceedings of the 8th Italian Conference on Sensors and Microsystems, 12th-14th February, 2003, Trento, Italy, in 'Sensors and Microsystems', copyright © 2004

by World Scientific Publishing Co. Pte. Ltd., p.312-317, ISBN: 981-238-741-1.

94. M. Epifani, A. Forleo, R. Rella, P. Siciliano, A. M. Taurino, A. D'Amico, C. Di Natale, D. Monti, S. Nardis, R. Paolesse "Preparation and characterization of hybrid porphyrin-tin dioxide chemical sensors", Proceedings of 9th National Conference on Sensors and Microsystems, Ferrara, 8-11 febbraio 2004.
95. M. Epifani, R. Diaz, A. Taurino, L. Francioso, P. Siciliano, J. R. Morante "Chemical synthesis, characterization and gas-sensing properties of Thin Films in the In₂O₃-SnO₂ System", Mater. Res. Soc. Symp. Proc. Vol. 828, A5.12.1-A5.12.6 (Proceedings of the 2004 Fall Meeting of the Materials Research Society, Boston, 27 November – 3 December 2004).
96. L. Francioso, D. S. Presicce, M. Epifani, P. Siciliano, A. Ficarella "Cheap silicon technology integrated sol-gel combustion sensor", Proc. SPIE, Vol. 5836, 2005: Smart Sensors, Actuators, and MEMS II; Carles Cane, Jung-Chih Chiao, Fernando Vidal Verdu Eds.; pp. 255-262. DOI: 10.1117/12.608565.
97. L. Francioso, D. S. Presicce, P. Siciliano, M. Epifani "Technology Advances in Batch Production of Pt-Doped TiO₂ Sol-Gel Oxygen Sensor", in: Sensors, 2005. 4th IEEE Conference on Sensors, 30 Oct.-3 Nov. 2005. Pages: 1192-1195. Digital Object Identifier 10.1109/ICSENS.2005.1597919.
98. L. Francioso, S. Capone, A. Forleo, M. Epifani, A.M. Taurino, P. Siciliano "In₂O₃-SnO₂ and SnO₂-PdO sol-gel thin films as new gas-sensing materials for NO₂ detection", Proc. of 10th Italian Conference on Sensors and Microsystems, 15th-17th February, 2005, Firenze, Italy.
99. L. Francioso, A. M. Taurino, A. Forleo, P. Siciliano, M. Epifani "Gas Sensing Response Improvement of Well-Aligned TiO₂ Nanowires Array", in: Sensors 2006. 5th IEEE Conference on Sensors, 22-25 Oct. 2006. Oct. 2007. Pages: 464-465. Digital Object Identifier: 10.1109/ICSENS.2007.355506.
100. S. Capone, M. Epifani, L. Francioso, D. Presicce, P. Siciliano, P. Carlucci "A novel method based on gas microsensors to analyze diesel engine oil contaminated by diluent unburned diesel fuel", in: Sensors, 2006. 5th IEEE Conference on Sensors, 22-25 Oct. 2006. Oct. 2007. Pages:1377-1379. Digital Object Identifier 10.1109/ICSENS.2007.355887.
101. S. Capone, M. Zuppa, D. S. Presicce, M. Epifani, L. Francioso, P. Siciliano, C. Distanti "Detection of unburned fuel as contaminant in engine oil by a gas microsensor array", Proc. SPIE, Vol. 6589, May 2007: Smart Sensors, Actuators, and MEMS III, Thomas Becker; Carles Cané N. Scott Barker, Eds.; pp. DOI: 10.1117/12.722007.
102. A. P. Caricato, S. Capone, M. Epifani, M. Lomascolo, A. Luches, M. Martino, F. Romano, R. Rella, P. Siciliano, J. Spadavecchia, A. Taurino, T. Tunno, D. Valerini "Nanoparticle thin films deposited by MAPLE for sensor applications", Proc. SPIE, Vol. 6985, January 2008: Fundamentals of Laser Assisted Micro- and Nanotechnologies, Vadim P. Veiko, Ed.; pp. DOI: 10.1117/12.786981.
103. A. Creti, M. Epifani, A. Taurino, M. Catalano, F. Casino, M. Lomascolo, M. Milanese, A. de Risi "Optical Absorption Measurements at High Temperature (500 °C) of Oxide

Nanoparticles for Application as Gas-Based Nanofluid in Solar Thermal Collector Systems", Proc. International Conference on Materials for Renewable Energy & Environment (MREE 2013), May 15-16, 2013, Nanjing, China. Advanced Materials Research Vol. 773 (2013) pp 80-86 (2013) Trans Tech Publications, Switzerland, doi:10.4028/www.scientific.net/AMR.773.80.

104. R. Milan, G. S. Selopal, I. Concina, M. Epifani, A. Vomiero, G. Sberveglieri "Tailor-made ZnO@SnO₂ networks for high efficiency photovoltaic device", Proc. SPIE 8987, Oxide-based Materials and Devices V, 898728 (March 8, 2014), doi:10.1117/12.2040382.
105. Epifani, M.; Comini, E.; Diaz, R.; Genc, A.; Arbiol, J.; Andreu, T.; Siciliano, P.; Faglia, G.; Morante, J. R. Surface Modification, Heterojunctions, and Other Structures: Composing Metal Oxide Nanocrystals for Chemical Sensors. Proc. SPIE 9364, Oxide-based Materials and Devices VI, 936401 (May 6, 2015); doi: 10.1117/12.2193000.

CONGRESSES (INVITED TALKS)

1. **M. Epifani** *"Oxide Nanocrystals from a Low Temperature Processing in Coordinating Environment: General Principles, Formation Mechanism and Gas-Sensing Applications"*, E-MRS Fall Meeting, Warsaw, 17-21 September 2007.
2. **M. Epifani** *"Metal oxide nanocrystals from sol-gel transition in coordinating environment. Synthesis and surface chemistry related applications"*, Romanian Conference on Advanced Materials, ROCAM 2009, Brasov (Romania), 25-28 August 2009.
3. **M. Epifani** *"The Synthesis-Structure-Property Relationship in Metal-Oxide Nanocrystals Based Gas-Sensors"*, MRS Fall Meeting, Boston (USA), 28 November – 2 December 2011.
4. **M. Epifani** *"Hydrolytic Colloidal Routes to Metal Oxide Nanocrystals. Synthetic Principles, Gas-Sensing Devices and Synthesis-Property Relationship"*, ICACC 2012 (36th International Conference and Exposition on Advanced Ceramics and Composites), Daytona Beach (USA), January 22-27, 2012.
5. **M. Epifani** *"The surface chemistry effects on the gas response of metal oxide nanocrystals. A combined experimental and theoretical investigation"*, ICACC 2013 (37th International Conference and Exposition on Advanced Ceramics and Composites), Daytona Beach (USA), January 27-February 1st, 2013.
6. **M. Epifani** *"Multifunctional titania materials: from surface modification to nanocrystal inclusion, and related applications"*, ICACC 2013 (37th International Conference and Exposition on Advanced Ceramics and Composites), Daytona Beach (USA), January 27-February 1st, 2013.
7. **M. Epifani** *"Modification of Metal Oxide Nanocrystal for Improved Sensing Performances: From Doping to Inorganic Surface Functionalization"*, 4th International Conference from Nanoparticles and Nanomaterials to Nanodevices and Nanosystems (IC4N), June 16-20, 2013, Kerkyra (Greece).
8. **M. Epifani** *"Modified metal oxide nanomaterials for gas sensing: from doping to surface coating and beyond"*, 38th International Conference and Expo on Advanced Ceramics and Composites (ICACC 2014), January 26-31, 2014, Daytona Beach, Florida.
9. **M. Epifani** *"Wet Chemical Routes to Metal Oxide Nanocrystals and Thin Films for Chemical Sensing"*, CIMTEC 2014 - 13th International Ceramics Congress, June 8-13, 2014, Montecatini Terme (Italy).
10. **M. Epifani** *"Modified Metal Oxide Nanocrystals: from Inorganic Surface Capping to Nanocomposites by Tailoring the Precursor Chemistry"*, XXIII International Materials Research Congress, August 17-21, 2014, Cancun (Mexico).
11. **M. Epifani** *"Composing Metal Oxide Nanocrystals for Improved Gas-Sensors: from Surface Modification to Inter-Oxide Cross-Talk"* 39th International Conference and Expo on Advanced Ceramics and Composites (ICACC 2015), January 25-30, 2015, Daytona Beach, Florida.
12. **M. Epifani** *"Surface modification, heterojunctions, and other structures: composing metal oxide nanocrystals for chemical sensors"* SPIE Photonics West 2015, Conference 9364: Oxide-based Materials and Devices, 7-12 February 2015, San Francisco.
13. **M. Epifani** *"Enhancing the Performance of Chemoresistive Gas-Sensors by*

Combining Metal Oxides: Doping, Surface Modification and Inter-Oxide Cross-Talk
MRS Spring Meeting, San Francisco, 6-10 April 2015.

14. **M. Epifani** *"Flexible chemical processing: multiple WO₃ typologies from a single precursor and their gas-sensing properties"* Pacifichem 2015, Honolulu, 15-20 December 2015.
15. **M. Epifani** *"Activating with and activated vanadia. Semiconductor nanocrystals embedded in V₂O₅-like layers: solvothermal synthesis and gas-sensing enhancement"* 40th International Conference and Expo on Advanced Ceramics and Composites (ICACC 2016), January 24-29, 2016, Daytona Beach, Florida.
16. **M. Epifani** *"From Thin Films to Nanocrystals: Assorted WO₃ Gas-Sensing Materials from Multifaceted Wet Chemical Processing"* 40th International Conference and Expo on Advanced Ceramics and Composites (ICACC 2016), January 24-29, 2016, Daytona Beach, Florida.
17. **M. Epifani** *"Composing Metal Oxide Nanostructures for Gas-Sensing and Environmental Remediation"* ET-CMOS 2016 - Emerging Technologies: Communications, Microsystems, Optoelectronics, Sensors, 25-27 May 2016, Montreal, Canada.
18. **M. Epifani** *"Metal Oxide Nanocomposites and Surface Modifications for Chemical Sensing"* CIMTEC 2016, 5-9 June, 2016, Perugia, Italy.
19. **M. Epifani** *"Enhancing the Surface Chemistry of Metal Oxide Nanocrystals by Metal Oxide Surface Deposition"* 5th International Conference from Nanoparticles and Nanomaterials to Nanodevices and Nanosystems (IC4N 2016), 26-30 June 2016, Porto Heli, Greece.

LECTURES AND SEMINARS

1. Lectures (12 hours) on *"Chemical Processing of Advanced Materials: Oxide-Based Materials for Gas-Sensing Applications"*, Consorzio Optel InP, Brindisi, Italy.
2. Lectures (4 hours) on *"Chemical Processing of Advanced Materials: Oxide-Based Materials for Gas-Sensing Applications"* Scuola teorico/sperimentale SISM/AISEM "Metodologie di preparazione e caratterizzazione di materiali e dispositivi per la sensoristica", Lecce, Italy, 7-11 Novembre 2004.
3. Seminar on *"Metal Oxide Nanocrystals by Sol-Gel Procedures. Synthesis principles, Formation Pathways and Gas-Sensing Applications"*, IMDEA Energy, Madrid, January 2011.
4. Lecture on *"Nanocrystallization: fundamentals of the synthesis of colloidal semiconductor nanocrystals"*, International Summer School on Fundamentals and Basic Methods of Crystal Growth, Brasov, Romania, 28-08-2009.
5. Lectures (8 hours) on *"Wet chemical synthesis of advanced oxide nanostructures"*, XXII International Summer School in Materials Science and Technology, La Habana, July 6th - July 17th, 2015.

1. Role in the project: Participant

Title: "MESSA A PUNTO DI UN SISTEMA DI RIVELAZIONE DELLA PRESENZA DI CARBURANTE NELL'OLIO

MOTORE IN SISTEMI MECCANICI ENDOTERMICI"

Typology: Italian

IMM funding (€): 449.000

Period of activity: from: 01/01/2005 to: 31/12/2008

2. Role in the project: Participant

Title: FOOD SAFETY AND QUALITY with Microsystems" (GOODFOOD)

Typology: European, VI° Programma Quadro Commissione Europea IST Priority

Total funding (€): 9.000.000

IMM funding (€): 365.520

Period of activity: from: 01/01/2004to: 30/09/2007

3. Role in the project: Participant

Title: General Olfaction and Sensing Projects on a European Level (GOSPEL)"

Typology: European. Network of Excellence VI° FP program EU, IST Priority

Total funding (€): 5.200.000

IMM funding (€): 70.000

Period of activity: from 01/01/2004 to: 30/06/2008

4. Role in the project: Participant

Title"Nanostructured- solid state gas sensors with superior performances (NANOS4)"

Typology: European, STREP project, VI° FP program EU, NMP Priority.

Total funding (€): 2.977.266

IMM funding (€): 218.429

Period of activity: from 01/01/2004 to: 31/03/2007

5. Role in the project: Participant

Title: "Nano-Tecnologie per la realizzazione di micro-componenti per il rilievo delle emissioni dei motori a combustione interna e della qualità dell'aria in ambienti confinati (SQUARE)

Typology: Italian, MIUR-FIRB

IMM funding (€): 217.000

Period of activity: Dal: 01/01/2004 to: 31/12/2006

6. Role in the project: Participant

Title: Environmental control by means of a new gas detection principle: Gas Sensing by Metal Oxide Hetero-junctions (GASMOH)

Tipologia / Finanziamento: European, STREP project, V* FP program EU (Progr. Copernicus 2)

Total funding (€): 434.194

IMM funding (€): 108.033,5

Period of activity: from: 01/12/2000 to: 30/11/2003