CURRICULUM VITAE

EUROPEAN FORMAT

(LAST FIVE YEARS)

PERSONAL INFORMATION

Name, Surname	**Letizia Savio**
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E-mail	letizia.savio@ge.imem.cnr.it
Website	http://www.cnr.it/people/letizia.savio
Nationality	Italian
Place and date of birth	Genova (IT), September 8th, 1974

RESEARCH FIELD **Material science (experimental), surface science and nanoscience.**

WORK EXPERIENCE

If CNR staff member: **BADGE N. (MATRICOLA): 1X1X5**
QUALIFICATION: RESEARCHER
LEVEL: III

PRESENT POSITION

Date	Since October 1st, 2008
Name and address of employer	Consiglio Nazionale delle Ricerche, Istituto dei Materiali per l' Elettronica ed il Magnetismo (IMEM-CNR), Genova Via Dodecaneso 33, 16146 Genova, IT.
Type of business or sector	Experimental research in surface science and nanoscience: spectroscopic and microscopic studies of two-dimensional systems. Particular attention was devoted to the molecule-surface interaction (with metallic surfaces, oxide ultra-thin films and graphene layers) for applications in catalysis, green chemistry and bio.interfaces.
Occupation or position held	Researcher, III level (permanent since December 15th, 2010)
Main activities and responsibilities	Since November 2016, Member of "Consiglio d'Istituto" (scientific board) of IMEM. January 2012 – December 2015, Responsible of Commessa (research group) MD.P06.002 (Properties of nanostructures surfaces and clusters) and reference person for the surface analysis laboratory at IMEM-Genova. December 2008 – July 2010, Added member of Consiglio d'Istituto di IMEM.
Notes	March – September 2011, Maternity leave.

EDUCATION AND TRAINING

Title of qualification awarded	Ph.D. in Physics.
Date	February 7th, 2002
Name and type of organisation providing education and training	Università degli Studi di Genova.

Title of the thesis	Dynamics of the interaction of oxygen and ethylene with defected Ag surfaces. (Supervisor Prof. Mario Rocca / External supervisor Prof. Rodolfo del Sole, Università di Roma 2).
Principal subjects occupational skills covered	Experience with ultra high vacuum systems and with spectroscopic methods of use in surface and material science.
Evaluation	Excellent (Ottimo)
Title of qualification awarded	Degree in Physics (4 years).
Date	September 9th, 1998
Name and type of organisation providing education and training	Università degli Studi di Genova.
Title of the thesis	HREELS study of the reactivity and electronic excitations of different O/Ag(001) phases. Supervisor Prof. Mario Rocca.
Principal subjects occupational skills covered	Experience with ultra high vacuum systems and high resolution electron energy loss spectroscopy (HREELS).
Evaluation	110/110 e lode.

RESEARCH ACTIVITIES
RESEARCH SECTOR

Letizia Savio has developed her research activity in the field of experimental material science. In particular, she has employed electron spectroscopies and scanning tunnelling microscopy to investigate the structure, reactivity and electronic properties of single crystal metal surfaces and of ultra-thin films (oxide layers, graphene and C-based nanostructures, monolayers of biological molecules).

*R*ecent research activities (last 5 years)

I) Graphene and graphene-based nanostructures.
(Research developed within a national project "FIRB2012: Futuro in Ricerca" in which Letizia Savio is coordinator of local unit).
a) The structure of pristine, n-doped and defected graphene grown on Ni(111) and the reactivity of these layers with respect to CO adsorption was characterized by combining scanning tunnelling microscopy (STM) with photoemission and vibrational spectroscopies. Contrary to expectations, weak CO chemisorption occurs also on the pristine graphene film due to the influence of the strongly interacting substrate
b) The surface assisted synthesis of graphene nanoribbons from 1,6-dibromopyrene precursors and of 1D carbon nanostructures from Br-corannulene was investigated by STM. The different processes (Ullman coupling and dehydrogenation plus C-C colupling) leading to intermediate compounds were identified and the final products (e.g. graphene nanoribbons with well-defined edge-site sequence and/or polymeric networks) were described in detail.

II) Structure and reactivity of ultrathin MgO/Ag(100) films.
The final morphology of MgO/Ag(100) monolayers depends both on usual growth parameters (temperature, Mg flux, O_2 pressure) and on additional factors as the cooling rate after growth and the accumulation of oxygen atoms at the metal-oxide interface. Controlling these parameters allows to tune the morphology of the film, passing from monolayer islands of irregular shape to perfectly squared bilayer islands to extended monolayers, limited in size only by the width of the underlying Ag(100) terraces. The chemical activity of the MgO films with respect to hydroxylation strongly depends on the oxide thickness and stoichiometry.

III) Self-assembly of glutamic acid on metal (Ag) and oxide (TiO_2) surfaces.
The adsorption state and the morphology of layers of (S)-Glu and (S)-Cys molecules self-assembled on Ag surfaces were characterised combining microscopic and spectroscopic analysis with the outcome of ab-initio simulations. In collaboration with Dr. D. Costa (ENSCP, Paris) and Dr. F. Tielens (UPMC, ParisVI). On TiO_2(110) the adsorption state is correlated to the defectivity of the oxide surface.

Technical skills

- Ultra high vacuum systems (UHV).
- High Resolution Electron Energy Loss Spectroscopy (HREELS).

- X-ray photoemission spectroscopy (XPS) both with conventional X-ray source and with synchrotron light source.
- Low Temperature Scanning Tunnelling Microscopy (LT-STM).
- Supersonic Molecular Beams and measurement of the gas-surface interaction dynamics with the "King&Wells" method.

ADDITIONAL INFORMATION

Teaching activity

- A.Y. 2013-2014. Co-teacher of the course "Microscopic and Spectroscopic Characterization of Materials" for Material Scientists, Dept. of Chemistry, Università di Genova, Genova, IT.
- A.Y. 2013-2014 and A.Y. 2016-2017. Co-teacher of the course "Microscopic and Spectroscopic techniques for surface and interface analysis" for the PhD School in Physics, Dept. of Physics, Università di Genova, Genova, IT.
-A.Y. 2016-1017. Teacher of the course of "Laboratorio di Fisica della Materia" for the Master degree (laurea specialistica) in Physics, Dept. of Physics, Università di Genova, Genova, IT.
-A.Y. 2018-19. Teacher of the course of "Surface Spectroscopies" for Material Scientists (SERP+ program), Dept. of Chemistry, Università di Genova, Genova, IT.

Recent scientific collaborations

- *2008–2015.* Dr. D. Costa (ENSCP, Paris, FR) and Dr. F. Tielens (UPMC, Paris VI, Paris, FR).
  Study of Glu/Ag(100) by LT-STM and ab-initio simulation. Funded by two HPC-Europa2 grants for mobility and computational resources.
- *October 2013. Prof.* S. Agnoli and Dr. L. Artiglia (Università di Padova,). HREELS study of the system ethanol/VO/TiO_2, developed at the IMEM surface science laboratory in Genova.
- *May 2014 – 2016.* Prof. G. Pacchioni, Dr. S. Tosoni, Dr. L. Giordano (Università di Milano Bicocca). Morphology of ultrathin MgO films and of Ni clusters deposited on them. STM measurements and ab-initio calculations.
- *2014- at present.* Prof. C. di Valentin, Prof. A. Papagni (Università di Milano Bicocca), F. Bondino, E. Magnano (CNR-IOM). Synthesis and characterization of doped graphene layers and of graphene-based nanostructures.

Managing of research projects.

- CNR-PAN 2017-19 Bilateral program Savio-Lewandowski. Title : "Catalytic conversion of N2O on ultrathin iron oxide films".
- *F*IRB2012: Futuro in Ricerca (RBFR128BEC): "Beyond graphene: tailored C-layers for novel catalytic materials and green chemistry". Responsible of local unit. Beginnig of project : March 21st, 2013; duration : 48 months.
- Progetto PAR-FAS of Regione Liguria: "Paste e inchiostri elettro-conduttivi, per applicazione su celle in silicio e su vetro". Reference person for IMEM.

Organization of Conferences/Congresses

- Member of the Organizing Commette of the 16th International Conference on Thin Solid Films and Surfaces (ICSFS16 - Genova, July 1-6, 2012).
- Member of the Organizing Commette of XXII Congresso AIV (Genova, May 20-22, 2015).

Editorial activity

- Referee for the following international scientific journals: Journal of Physical Chemistry, Physical Review Letters, The European Physical Journal, The e-Journal of Surface Science and Nanotechnology, Chirality.
- Since October 2012, member of the Editorial Board of The Scientific World Journal (Atomic and Molecular Physics).

Awards

- *2001:* Award of the Società Italiana di Fisica for the scientific production as a young scientist.
- *2008:* Award of the Società Italiana di Fisica for the best presentation in the "material science" session at the SIF National Conference (Genova, September 22-27, 2008).

Additional duties

- *2014-2016 Supervisor of 1 internship for bachelor degree in material science and of 1 Ph.D. thesis in material science.*
- *June 2013- January 2016,* Member of the Teacher Council of the Ph.D. School in Physics of the Università degli Studi di Genova.
- *2014.* Scientific Evaluator for the "Programme Convergence: Appel à projets Emergence", Sorbonne Universitées, Paris, F.
- Member of the evaluation committee for a 3 years researcher position at IMEM-CNR (CNR call n. 126.260.C.20) and for a permanent position for technical staff (CNR call n. 367.90).

Languages

Italian, mothertongue;
English, excellent (written and spoken)
French, basic.

Dissemination of results

7 invited talks, 21 contributed talks at national and international conferences.

BIBLIOMETRY

76 publications in peer-reviewed international scientific journals;
7 book chapters;
1523 citations (1270 without self-citations) (source WOS)
H-index 22.

SELECTED PUBLICATIONS (LAST 5 YEARS)

1. "Synthesis of corrugated C-based nanostructures by Br-corannulene oligomerization". M. Smerieri, I. Pisˇ, L. Ferrighi, S. Nappini, A. Lusuan, L. Vattuone, L. Vaghi, A. Papagni, E. Magnano, C. Di Valentin, F. Bondino, L. Savio, *Phys. Chem. Chem. Phys*. 20, 26161 (2018).
2. "Chemisorption of CO on N-doped graphene on Ni(111)". G. Carraro, E. Celasco, M. Smerieri, L. Savio, G. Bracco, M. Rocca, L. Vattuone, *Appl. Surf. Sci.* 428, 775 (2018).
3. "Adatom Extraction from Pristine Metal Terraces by Dissociative Oxygen Adsorption: Combined STM and Density Functional Theory Investigation of O/Ag(110)". J. Pal, T.B. Rawal, M. Smerieri, S. Hong, M. Alatalo, L. Savio, L. Vattuone, T.S. Rahman, M. Rocca, *Phys. Rev. Lett*. 118, 226101 (2017).
4. Synthesis of graphene nanoribbons with a defined mixed edge-site sequence by surface assisted polymerization of (1,6)-dibromopyrene on Ag(110). M. Smerieri,I. Píš, L. Ferrighi, S. Nappini, A. Lusuan, C. Di Valentin, L. Vaghi, A. Papagni, M. Cattelan, S. Agnoli, E. Magnano, F. Bondino, L. Savio, *Nanoscale* 8, 17843 (2016).
5. CO chemisorption at vacancies of supported graphene films: a candidate for a sensor? E. Celasco, G. Carraro, A. Lusuan, M. Smerieri, J. Pal, M. Rocca, L. Savio, L. Vattuone, *Phys.Chem.Chem.Phys.*18, 18692 (2016).
6. Enhanced Chemical Reactivity of Pristine Graphene Interacting Strongly with a Substrate: Chemisorbed Carbon Monoxide on Graphene/Nickel(111). M. Smerieri, E. Celasco, G. Carraro, A. Lusuan, J. Pal, G. Bracco, M. Rocca, L. Savio, L. Vattuone, *ChemCatChem* 7, 2328 (2015).
7. Adsorption and self-assembly of bio-organic molecules at model surfaces: A route towards increased complexity. D. Costa, C.-M. Pradier, F. Tielens, L. Savio, *Surf. Sci. Rep.* 70,449 (2015).
8. Spontaneous Oxidation of Ni Nanoclusters on MgO Monolayers Induced by Segregation of Interfacial Oxygen. M. Smerieri, J. Pal, L. Savio, L. Vattuone, R. Ferrando, S. Tosoni, L. Giordano, G. Pacchioni, M. Rocca, *J. Phys. Chem. Lett.* 6, 3104 (2015).
9. Morphology of monolayer MgO films on Ag(100): switching from corrugated islands to extended flat terraces. J. Pal, M. Smerieri, E. Celasco, L. Savio, L. Vattuone, M. Rocca, *Phys. Rev. Lett*. 112, 126102 (2014).

10. From Vanadia Nanoclusters to Ultrathin Films on TiO_2(110): Evolution of the Yield and Selectivity in the Ethanol Oxidation Reaction. L. Artiglia, S. Agnoli, L.Savio, J. Pal, E. Celasco, M. Rocca, F. Bondino, E. Magnano, C. Castellarin-Cudia, F.P. Netzer, G. Granozzi, *ACS Catal.* 4, 3715 (2014).

TRATTAMENTO DEI DATI PERSONALI, INFORMATIVA E CONSENSO

Il D.Lgs. 30/6/2003, n. 196 "*Codice in materia di protezione dei dati personali*" regola il trattamento dei dati personali, con particolare riferimento alla riservatezza, all'identità personale e al diritto di protezione dei dati personali; l'interessato deve essere previamente informato del trattamento .
La norma in considerazione intende come "trattamento" qualunque operazione o complesso di operazioni concernenti la raccolta, la registrazione, l'organizzazione, la conservazione, la consultazione, l'elaborazione, la modifica, la selezione, l'estrazione, il raffronto, l'utilizzo, l'interconnessione, il blocco, la comunicazione, la diffusione, la cancellazione e la distruzione di dati, anche se non registrati in una banca dati.
In relazione a quanto riportato, autorizzo il CNR al trattamento dei dati contenuti nel presente *curriculum vitae* e nella documentazione della quale fa parte integrante

(*barrare la casella*) x Si, acconsento

Genova, January 23rd, 2019

Letizia Savio