Luca Gregoratti – Curriculum Vitae

Academic qualification:

1988 – High school diploma at the Liceo Scientifico Statale 'A. Einstein', Cervignano, Italy.

1994 – University Physics degree obtained at the Università degli Studi di Trieste, Trieste, Italy; final score 110/110; supervisor: Prof. Renzo Rosei. Thesis title: "*Effects of the adsorbate structure on the catalytic activity of surfaces: CO+O_2 and H_2+O_2/Rh(100) reactions"*.

2003 – PhD in Physics obtained at the King's College London, London, UK. Supervisor: Prof. G.R. Morrison. Thesis title: "*Scanning Photoemission Microscopy of the silicide phases formed in Ni/Si(111) and Ni+Au/Si(111) systems*"

Working experience:

1995-2001: fixed term contracts at Elettra - Sincrotrone Trieste SCpA (Elettra). The activities were focused on: (i) the design, assembling and testing of the experimental chambers of the ESCAmicroscopy beamline which hosts a Scanning Photoemission Microscope (SPEM); (ii) users support (iii) the development of a new system for the acquisition and visualization of the data and the control of the experimental stations based on a new multichannel electron detector.

2001 – today: full time contract at Elettra as head of the Escamicroscopy beamline.

2011 – 2019: Coordinator of the Microscopy/Diffraction Beamlines Group at Elettra.

2019 – today: member of the Elettra 2.0 project working team for coordination of the beamlines and laboratories upgrade plan.

Teaching & training activities

As head of the Escamicroscopy beamline and Coordinator of the Microscopy/Diffraction Beamlines Group of Elettra I continuously perform teaching and training activities at national and international level. I have been lecturer at schools such as "*ICTP School on Synchrotron Radiation and Applications, Italy", "International Conference-School Advanced Materials and Technologies, Lithuania" or the "HERCULES European School-neutrons and synchrotron radiation for science".*

Participation as board member of conferences and school committees

- Since 2011 I am the Elettra contact point for the training programs in collaboration with the International Agency for Atomic Energy (IAEA) and the International Center for Theoretical Physics (ICTP).
- Since 2015 member of the "International Advisory Committee (IAC)" for the X-ray Microscopy Conference.
- Since 2017 member of the Scientific Committee of the "Conventional and High-energy spectroscopies for surface analysis – An unconventional school for PhD students and young investigators".

Publications and patents

- Author and coauthor of more than 200 peer reviewed publications on international scientific journals.
- Coinventor of 2 patents (owned by Elettra - Sincrotrone Trieste) related to the development of an innovative anticounterfeiting technology (PCT/EP2008/051320 and PCT/EP2010/070096).

Experimental skills & current research tasks

- Materials and interfaces characterization by mean of surface sensitive analysis techniques of conventional type (LEED, XPS, AES, SEM, EDX, PEEM, LEEM) and based on synchrotron radiation (Scanning Photoemission Spectromicroscopy (SPEM) and some experience with STXM and XPEEM).
- Support to the experiments proposed and realised by the users at the Escamicroscopy beamline and development of own research topics. Current research tasks include:
    - Characterization of the catalytic and sensing properties of nanomaterials by means of photoemission spectromicroscopy.
    - Development of chemical imaging techniques and procedures for the characterization of devices under operando conditions.
    - Characterization of supported and free standing 2D materials.
    - In-situ and operando characterization of solid-gas model catalytic and electrochemical system with surface science techniques.
- Design and realization of vacuum chambers, sample manipulators and movement stages for UHV applications. Design and realization of software user interfaces for spectromicroscopy setups.
- Development of upgrades, methods and procedures to overcome the "pressure gap" limitations in SPEM systems.
- Development of an innovative anticounterfeiting technology based on the use of synchrotron radiation.
- I developed the first setup aimed to run spatially resolved photoemission near ambient pressure experiments. Currently the SPEM at the Escamicroscopy beamline at Elettra is the only SPEM worldwide where NAP measurements can be performed at the nanoscale.
- Management and coordination of work teams on specific research projects and ordinary activities.

National and international projects

I have prepared on my own or collaborated to the preparation of many regional, national and European projects, several of them have been funded (FP6-NanO2 (Oxidation of nanomaterials), FIRB-LUCI (Innovative and efficient solid state light sources for daily life and automotive applications), LR11-Acciai (Characterization and optimization of austeninc steels), LR30-NanoBioSOLED (Organic-inorganic interfaces – OLEDs), LR30-ACT (Development of innovative anticounterfeiting technology), LR47-NanoTOX (Toxicity of nanoparticles)).
Several of the above mentioned projects have been lead by Companies and focused on applied research.
For several years I followed the activities of the European Technology Platform ENIAC in collaboration with the Industrial Liaison Office of Elettra - Sincrotrone Trieste.

Activities as reviewer/referee

I am periodically asked to review manuscripts by several journals such as Surface Science and Applied Surface Science, Nanomaterials, Journal of Synchrotron Radiation, Surfaces, Carbon, Chemical Papers.
I periodically evaluate scientific project at national and international level (e.g. Swiss National Science Foundation-SNF, DLR Project Management Agency, Germany)

Duties of the Coordination of the Microscopy-Diffraction Beamlines Group

From 2011 to 2019 I was the Coordinator of this Group at Elettra (that together with the Spectroscopy-Scattering Beamline Group was covering the all beamlines/laboratories of Elettra/FERMI). At Elettra the Group Coordinators have a role of interface between the beamline/laboratories and the Company management, main duties associated to this position included people assignment to the different activities, coordination of the selection of all the personnel of the beamlines/laboratories, lead of the people and activities evaluation procedures foreseen by our Company, management of several cost centers (travels, extraordinary maintenance, cryogenic gases, etc.)

Main current activity

Within the Elettra 2.0 project I am coordinating (together with former second Group Coordinator) all plans related to the construction and upgrade of the beamlines/laboratories on the new machine. It implies a constant coordination with all the resources needed for this ambitious project (machine, infrastructures, services, etc.).

Main publications list

Selected list of recent publications. The full list can be found at SCOPUS or WoS websites.

How the anisotropy of surface oxide formation influences the transient activity of a surface reaction Winkler P., Zeininger J., Suchorski Y., Stöger-Pollach M., Zeller P., Amati M., Gregoratti L., Rupprechter G. *Nature Communications, Vol. 12 - 1, pp. 1-8 (2021)*

Near ambient pressure photoelectron spectro-microscopy: from gas-solid interface to operando devices Amati M., Gregoratti Luca, Zeller Patrick, Greiner Mark, Scardamaglia M., Junker

Benjamin, Russ Tamara, Weimar Udo, Barsan Nicolae, Favaro Marco, Alharbi Abdulaziz, Jensen Ingvild Julie Thue, Ali Ayaz, Belle Branson *Journal of Physics D: Applied Physics, Vol. 54 - 20, 204004 (2021)*

Atomic and Electronic Structure of a Multidomain GeTe Crystal Frolov A.S., Sánchez-Barriga J., Callaert C., Hadermann J., Fedorov A.V., Usachov D.Y., Chaika A.N., Walls B.C., Zhussupbekov K., Shvets I.V., Muntwiler M., Amati M., Gregoratti L., Varykhalov A.Y., Rader O., Yashina L.V. *ACS Nano, Vol. 14 - 12, pp. 16576-16589 (2020)*

Interfacial studies in CNT fibre/TiO2 photoelectrodes for efficient H2 production Moya A., Barawi M., Alemán B., Zeller P., Amati M., Monreal-Bernal A., Gregoratti L., de la Peña O'Shea V.A., Vilatela J.J. *Applied Catalysis B: Environmental, Vol. 268, 118613 (2020)*

Highlighting the Dynamics of Graphene Protection toward the Oxidation of Copper Under Operando Conditions Scardamaglia M., Struzzi C., Zakharov A., Reckinger N., Zeller P., Amati M., Gregoratti L. *ACS Applied Materials and Interfaces, Vol. 11 - 32, pp. 29448-29457 (2019)*

Spatially Resolved XPS Characterization of Electrochemical Surfaces Bozzini B., Kuscer D., Amati M., Gregoratti L., Zeller P., Dobrovolska T., Krastev I. *Surfaces, Vol. 2 - 2 (2019)*

Spatially Resolved Photoelectron Spectroscopy from Ultra-high Vacuum to Near Ambient Pressure Sample Environments Gregoratti L., Al-Hada M., Amati M., Brescia R., Roccella D., Sezen H., Zeller P. *Topics in Catalysis, Vol. 61 - 12-13, pp. 1274-1282 (2018)*

Size contrast of Pt nanoparticles formed on neighboring domains within suspended and supported graphene Roccella D., Amati M., Sezen H., Brescia R., Gregoratti L. *Nano Research, Vol. 11 - 3, pp. 1589-1598 (2018)*

Compositional and structural studies of ion-beam modified AlN/TiN multilayers Amati M., Gregoratti L., Sezen H., Grce A., Milosavljević M., Homewood K.P. *Applied Surface Science, Vol. 411, pp. 431-436 (2017)*

Laterally Selective Oxidation of Large-Scale Graphene with Atomic Oxygen Kapitanova O.O., Kataev E.Y., Usachov D.Yu., Sirotina A.P., Belova A.I., Sezen H., Amati M., Al-Hada M., Gregoratti L., Barinov A., Cho H.D., Kang T.W., Panin G.N., Vyalikh D., Itkis D.M., Yashina L.V. *Journal of Physical Chemistry C, Vol. 121 - 50, pp. 27915-27922 (2017)*