Curriculum Vitae of

Dr. Alessandra Gianoncelli

October 2024

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Work: ELETTRA Sincrotrone Trieste, X-ray Microscopy Section,
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short bio:

Alessandra Gianoncelli received her Laurea and PhD from the department of Electronics Engineering and Information of Politecnico di Milano, Italy. In January 2005, she completed her first PostDoctoral training in the Department of Physics, King's College, University of London, UK, where she participated in the EU funded "TwinMic" project. In Spring 2005, she held a Lecturer post in the same department. In Spring 2007 she completed a two years PostDoctoral Research activity at the Centre de Recherche et de Restauration des Musées de France (C2RMF), at the Louvre Museum, Paris, where she was involved in the EU funded EuArtech project (Access, Research and Technology for the conservation of the European Cultural Heritage). Since April 2007 she is a Beamline scientist at the TwinMic beamline in Elettra Sincrotrone Trieste, Italy and she became the responsible of it in 2011. She has been active in the broad area of X-ray Spectroscopy, where her contribution includes the development of the low energy X-ray Fluorescence (XRF) system for the TwinMic microscope and development of novel approaches like one of the first portable XRF spectrometers based on Silicon Drift Detectors. She had the chance to use her new portable systems on important works of art, like the Lupa Capitolina in Rome. At the C2RMF she was responsible of the development of modern XRF and XRD (powder diffraction) instrumentations. She was involved in non-destructive analysis of Leonardo da Vinci's Mona Lisa / La Gioconda as well. In TwinMic her main research activities include X-Ray Microscopy and X-ray Imaging mainly applied to the life sciences. She holds a patent concerning an innovative X-ray Diffraction (XRD) system and has co-authored more than 190 papers. In parallel she has always been practising academic teaching. At the moment she is teaching the Archaeometry course in the University of Trieste, faculty of Letters and Philosophy. She is fluent in Italian, French and English, and she can write and speak Greek, and basic Russian and Slovenian. Alessandra is an avid runner that has run the London, Paris and Athens marathons.

Formal Education

1999–2003 • Ph.D. – Department of Electronics Engineering and Information - Politecnico di Milano - Milano, Italy.

Thesis:	"Development of innovative XRF instrumentation for microanalysis of materials"
Supervisor:	Professor Antonio Longoni
Contribution:	The primary PhD activity concerned the development of new radiation detectors and their related applications. In particular, a novel type of detector, based on a ring-shaped monolithic array of 12 Silicon Drift Detectors was developed. As an excitation source, an X-ray tube with policapillary lenses was used, with an x-ray spot of 50 μm of diameter. Due to the high spatial and energy resolution, this new instrument is especially suitable for elemental mapping. Part of the activity also concerned the development of new possible applications for a portable XRF spectrometer. For example a new method for determining the thickness of coatings deposited on bulk material was implemented.

1993-1999 • Laurea in Electronics Engineering (5 years full time leading to M.Eng) Politecnico di Milano - Milano, Italy.

Grade:	Distinction 100 / 100

Master Thesis: "X-ray spectroscopy: New applications with portable instrumentation"

Supervisor: Professor Antonio Longoni

Contribution: Development of a novel portable XRF spectrometer based on a Silicon Drift Detector. XRF analysis *in situ* on some important works of art: bronze statues such as Lupa Capitolina and Spinario, at the Musei Capitolini in Rome.

Research Experience

June 2011 - Today
- Principal Beamline scientist
- TwinMic X-ray Microscopy beamline, Elettra Sincrotrone Trieste, Trieste, Italy

2007 - 2011
- Beamline scientist
- TwinMic X-ray Microscopy beamline, Elettra Sincrotrone Trieste, Trieste, Italy

Contribution:
- Development of a low energy XRF system in the TwinMic X-ray microscopy station for simultaneous elemental mapping and absorption and phase contrast imaging.
- Participation in the Commissioning of the beamline
- Further development and upgrade of the beamline.
- Assistance, support and advice to the users
- Promoting the interaction between the cultural heritage field and the synchrotron facility both by increasing collaborations and by teaching an Archaeometry course in Trieste University.

Supervision: Dr. Maya Kiskinova and Dr. Burkhard Kaulich

April 2005 - March 2007
- Postdoctoral Researcher
- Centre de Recherche et de restauration des Musées de France (C2RMF), Louvre Museum, Paris, France

R&D project: EC RT&D project "EuArtech" (Access, Research and Technology for the conservation of the European Cultural Heritage).

Contribution:
- Development of a portable XRF and XRD instrumentation for Cultural Heritage materials. The combination of both techniques allows performing both elemental analysis and phase identification of inorganic materials, directly on the field. The challenging part was the development of the XRD system. The choice of a 2D image plate detector and of a X-ray tube policapillary optics made it possible to identify the main crystalline phases in relatively short times (30 min up to 2 hours).
- Close collaboration and several tests on energy- and angle-dispersive XRD at the Crystallography Laboratory in Grenoble.
- Development of a laboratory X-ray micro-diffraction instrumentation (X-ray spot with a diameter less than 200µm).
- Analysis and interpretation of XRD diagrams.

Supervision: Dr. Philippe Walter and Dr. Jacques Castaing

2003-2005
- Postdoctoral Research Assistant
Department of Physics, King's College, University of London, London, UK

R&D project: EC RT&D project "Twinmic" (HPRI-2001-RTD-50024): multipurpose twin X-ray microscopy station

Contribution: Development of the fast readout detector system (to be used as a configurable detector system) for the Scanning Transmission Operation Mode of the TwinMic microscope. The developed system provides a completely flexible range of configurable detector response functions that can be chosen after the image data has been recorded. A variety of different imaging modes can be produced simultaneously from a single scan of the sample: brightfield and darkfield modes, and both absorption and phase contrast methods. The system is currently in use in the TwinMic microscope installed at Elettra synchrotron, Trieste. A new technique of Differential Phase Contrast based on the use of this configurable CCD detector has been studied and tested. In principle, the method allows quantitative measurements of the sample complex refractive index.

Supervision: Dr. Graeme R. Morrison

Academic Teaching

2007-2011 • Faculty of Letters and Philosophy, University of Trieste
Lecturer
Subject: Archaeometry

2007-2010 • Dept. of Chemical Engineering, University of Trieste
Series of Seminars
Subject: Analysis and Modelling of experimental data

Spring 2005 • Dept. of Physics, King's College, University of London
Lecturer
Subject: Basic Physics III

2003-2005 • Dept. of Physics, King's College, University of London
Supervision of Laboratory sessions and tutoring
Subject: Laboratory Physics

2000-2002 • Dept. of Electronics Engineering, Politecnico di Milano
Teaching assistant for the subjects: Electronics, Electronic Devices (Semiconductor Physics), Physics II

Other Teaching Activities

* Hercules School March 2024, Trieste, Italy. Lecturer.
Hercules School 20-24 March 2023, Trieste, Italy. Lecturer.
* XVI School on Synchrotron Radiation "Gilberto Vlaic": Fundamentals, Methods and Applications, 19-30 Sept 2022, Muggia, Trieste, Italy. Lecturer.
* HERCULES 2021 SCHOOL 15-19 March 2021, Trieste, Italy. Lecturer.
* XV School on Synchrotron Radiation: Fundamentals, Methods and Applications, 16-27 September 2019, Muggia, Trieste, Italy. Lecturer.
* School on Synchrotron and Free-Electron-Laser Methods for Multidisciplinary Applications, 7-18 May 2018, ICTP, Trieste, Italy. Lecturer.
* School on Synchrotron and Free-Electron-Laser Based Methods: Multidisciplinary Applications and Perspectives, 4-15 April 2016, ICTP, Trieste, Italy. Lecturer.
* Joint ICTP/IAEA School on Novel Experimental Methodologies for Synchrotron Applications in Nano-Science and Environmental Monitoring, 17-28 November 2014, ICTP, Trieste, Italy. Lecturer.
* Workshop on Portable X-ray Analytical Instruments for Cultural Heritage, 19-29 April - 3 May 2013, ICTP, Trieste, Italy. Lecturer.
* Advanced School on Synchrotron Techniques in Environmental Scientific Projects, ICTP, Trieste, Italy, 15-26 April 2013, ICTP, Trieste, Italy. Lecturer.

* School on Synchrotron Radiation and FEL Based Methods and their Multidisciplinary Applications, 19-26 March 2012, ICTP, Trieste, Italy. Lecturer.
* Synchrotron Radiation Applications in Cultural Heritage and Environmental Sciences - Multidisciplinary Aspects of Imaging Techniques, 21-25 November 2011, ICTP, Trieste, Italy. Lecturer.
* XI School on Synchrotron Radiation: Fundamentals and Applications, 5-16 september 2011, Duino Castle, Trieste, Italy. Lecturer.
* ICTP school on Development and characterisation of materials for hydrogen based energy systems: role of nuclear technology, 16-18 June 2011, ICTP, Trieste, Italy. Lecturer.
* COST training school: "Wood Cultural Heritage conservation: advanced X-Ray and optical techniques", 16-21 May 2011, Florence - Pisa, Italy. Lecturer.
* School on Cultural Heritage, 25-26 November 2009, INFN, Torino, Italy. Lecturer.
* Advanced School on Synchrotron and Free Electron Laser Sources and their Multidisciplinary Applications, 7 April - 25 April 2008, ICTP, Trieste, Italy. Lecturer.
* Nanotechnologies applied to the aquatic environment workshop, April, 3-4 2008, Trieste, Italy. Lecturer.

Industrial Experience

2000-2001 • EniTecnologie© SpA, Italy – Physics and Chemistry R&D Unit
Post: Researcher
resulted to the: “Analysis of different materials with Scanning Electron Microscope”: comparison between EDS, WDS and XRF techniques

Languages

Italian	:	Native
English	:	Fluent ; PostDoc and teaching in University of London
French	:	Fluent ; CELF exam and research post in C2RMF, Paris, France.
Greek	:	Advanced spoken and written; Certificazione di Conoscenza della Lingua Greca, University of Thessaloniki, Greece, B2 level.
Russian	:	Basic spoken ; 2nd year, course in King’s College Modern Language Centre; course in Paris.
Slovenian	:	Basic spoken ; 1st year course.

Accredited Courses

2003-2006• Graduate Certificate in Academic Practice (2 years, equivalent to level three of an undergraduate degree and at Honours level)- King’s College Institute of Learning and Teaching, coordinator Dr. Stylianos Hatzipanagos

Nov 2004• Certified in First Aid – St. John’s Ambulance

Selected IT Skills

Misc • programming for data analysis (IDL, Matlab, LV), advanced use of specialised software for data analysis (FIT2D, PyMCA, QXAS-Axil, EVA)
Control • Use of TwinMic beamline and Endstation control software

International Committee:

2019-2023• Part of the Beamline Advisory Panel for the design and construction of the Nanoprobe beamline of the Australian Synchrotron
2013-2017• Part of the Beamline Advisory Panel for the design and construction of the SoftiMAX beamline of the MAX IV Synchrotron
2017-today• Part of the Scientific Committee of the ICXOM (International **Congress** on X-ray Optics and Microanalysis) conference (organised in Trieste in September 2017 by A. Gianoncelli)
2010-2023• Part of Peer Review Committee of the Canadian Light Source
2023- today• Chair of Peer Review Committee of the Canadian Light Source

2021- today• Part of the Nanoscience Panel Advisory Committee for proposals submitted to NanoMAX beamline at MAX IV Synchrotron

Patents

In November 2006 CNRS (Centre Nationale de la Recherche Scientifique, France) initialised the patent registration procedure for a novel system of chromatic and angular filtering for X-ray diffraction. The patent was deposited in March 2007 (Patent application V/ref.: 01169-01; N/ref.: 243210 D 25018ST). It is a joint work with the Laboratoire de Cristallographie CNRS UPR5031, Grenoble. Further details can be set at your disposal upon request.

References

Dr. **Maya Kiskinova**, Elettra Sincrotrone Trieste, X-ray Microscopy Section, Trieste, Italy

Prof. **Benedetto Bozzini**, Dipartimento di Ingegneria dell'Innovazione, Università del Salento, Lecce, Italy

Dr. **Burkhard Kaulich**, Diamond Light Source, Didcot, Oxfordshire, Uk.

Dr. **Jacques Castaing**, Dr. **Philippe Walter** and Dr. **Michel Menu**, Centre de Recherche et de Restauration des Musées de France, Louvre Museum, Paris, France

Dr. **Graeme R. Morrison**, Univerisity College London, London, UK

Prof. **Antonio Longoni**, Dept. of Electronics Engineering and Information - Politecnico di Milano, Italy

Further information or details can be set at your disposal upon request.
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