CURRICULUM VITAE of Antonio Bianconi

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Author of 7 books and more than 350 pubblications in international scientific journals
see http://www.citeulike.org/user/abiancon
h-index=51 , with more than 9000 citations.

Prof. Antonio Bianconi,
1969 Doctor Degree in Physics, University of Rome with a thesis on Liquid Helium.
1969 -1971 Post Doc at Euratom Plasma Laboratory in Frascati and Frascati Laboratories of INFN,
1972-1975 Assistant Professor at University of Camerino
1976-1977 Research Associate at Stanford University
1978-1980 Associate professor at Camerino University
1980-1985 Associate professor at Roma University
1985 Visiting professor at University of Paris VI, France
1986 Visiting professor at University of Tsukuba, Japan.
1987-1992 Full professor of Physics at University of L'Aquila, L'Aquila, Italy
1992-1993 Visiting Professor at University of Paris Sud, Orsay, France
1993- 2012 Full Professor, chair of Biophysics, at University of Rome La Sapienza, Rome Italy
2012 – Director of the Rome International Center of Materials Science, Superstripes (RICMASS) and Mediterranean Institute of Fundamental Physics (MIFP), Rome Italy

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Research activity:

*Electron mobility in the superfluid helium film at the Rome Physics Institute (*1967-1969).*Wave transformation of photons into surface-plasmons in thin films at the Euratom Plasma Laboratory in Frascati (*1969-1971). *Synchrotron radiation research at the 1 GeV Frascati synchrotron in Frascati with Ugo Fano (*1971-1975; a) *x-ray photoemission and soft X-ray absorption of amorphous aluminum oxide and palladium hydride produced by electrochemistry. Development of new synchrotron radiation spectroscopies at the Stanford Synchrotron Radiation Laboratory (SSRL) in* 1976-1977 with Seb Doniach*: a) optical EXAFS in ionic crystals; b) Ca K-edge X-ray absorption of biological systems Ca ATPResearch work at the "*Xerox Palo Alto Research Center" (Xerox PARC) *a) The high energy electronic states in graphite detected by photoemission with tunable soft x-rays; b) bond length variation in nitrogen and hydrocarbon molecules by detecting the shape resonances beyond the 1s core ionization potential in soft x-ray spectroscopy of gases; c) structural differences between the bulk and the surfaces of clean metals by using a novel experimental approach: surface x-ray absorption: d) structure of metastable oxides in aluminum and silicon surfaces*
Research in Synchrotron radiation at Adone Storage Ring in Frascati where he has developed the XANES (X-ray Absorption Near Edge Structure) spectroscopy based on shape resonances above the ionization threshold (1980), Collaboration with John Pendry to extract information on higher terms of the atomic correlation function beyond the standard pair correlation function (PDF) via multiple scattering theory of XANES in complex systems. Local lattice distortions and active site fluctuations of

metalloproteins using XANES. He has applied x-ray absorption spectroscopy EXAFS and XANES to biological systems to measure the local structure of protein in solution with a very fast structural probe. In the field of biophysics of metalloproteins, he has determined the active site structure of calcium binding proteins and hemo-proteins by XANES. He has developed the time resolved XANES spectroscopy and polarized XANES of metallo-proteins. He has investigated the photo-induced out-of-equilibrium structural transition in the local active site of hemo-proteins by time and temperature dependent XANES have shown the presence of the metastable state of physisorbed horizontal CO on the heme surface as the first intermediate state in the dynamics of photo-induced dissociation of carbonmonoxy-myoglobin and hemoglobin. Recently he has been investiging the structure of intrinsically disordered proteins and the spatial fluctuation of the myelin periodic structure in frog axons. He provided first direct evidence of local valence fluctuations in mixed valent oxides and doped Mott insulators, like, CeO2, PrO2 and defective NiO, by XANES and high energy photoemission at the Synchrotron radiation at LURE, Orsay France and at Photon Factory at Tsukuba in Japan (1986-1987) Since march 1987 he has addressed his scientific interest to the charge and lattice fluctuations in complex oxides showing high temperature superconductivity.

The first key discovery in this field has been the compelling experimental evidence that the doped holes occupy the oxygen orbital (march-april 1987) using Cu L3 XANES spectroscopy.
The second key discovery has been that the $YBa_2Cu_3O_{6+y}$ system is a multiband superconductor (January 1988) where the doped holes are in both the planar oxygen orbital of the $Cu(2)O_2$ layers and in the vertical oxygen orbital of atoms in the spacer layers containing the Cu(1)O chains, using polarized XANES spectroscopy of single crystals (Dec 1987).
The third key discovery in the field of high temperature superconductors has been the compelling experimental evidence of instantaneous nanoscale phase separation between two structural phases of the CuO_2 lattice mede of stripes of undistorted Cu sites and distorted Cu sites by joint EXAFS, XANES and copper resonant x-ray diffraction. This result has provided the first evidence for the complexity of the CuO_2 plane where fast local lattice fluctuations associated with staes with different orbital moment. These results in 1992 have opened the search for "stripes" in high T_C superconductors introducing the complexity scenario for a system close to a structural phase transition
The fourth key discovery has been that the lattice phase separation is controlled by a second variable beyond the charge density: the "misfit strain" between different oxide layers forming the high Tc superconductors where the induced microstrain of the CuO_2 superconducting planes controls the critical temperature.
He has measured the fast valence fluctuations in correlated systems by XANES
He has introduced new experimental methods using synchrotron radiation for the study of complex condensed matter:
• *Surface XANES of clean surfaces and oxides*
• *Optical EXAFS, or XEOL (x-ray emission optical luminescence),*
• *Polarized XANES of metalloproteins,*
• *Polarized EXAFS of single crystals at high momentum transfer for the statistical distribution of instantaneous local lattice fluctuations*
•*Temperature derivatice X-ray absorption spectroscopy TDXAS*

Research programs, professional activities,
He has been leader of many research programs, he has been a pioneer in the synchrotron radiation research projects in Italy, USA, France, Japan ect., he has proposed the European Synchroton Research facility ESRF machine and has been in the first scientific commission of ESRF.

Alumni: Ex students and Post Docs:

1. • Aldo Giovannelli (University of L'aquila, L'Aquila)
2. • Bruno Oesh (Zurich, Switzerland)
3. • Isabella Ascone (CNRS Paris, France)
4. • Loriana Castellani (full Prof. University of Cassino, Italy)
5. • Joaquin García (full Prof. University of Saragoza, Spain)
6. • Alexander Soldatov (full Prof. Rostov University, Russia)
7. • Chen xi Li (full Prof. Bejing Univ China)
8. • Augusto Marcelli (INFN Frascati)
9. • Andrea Di Cicco (Camerino University, Camerino)
10. • Maurizio De Santis (CNRS Grenoble, France)
11. • Stefano Della Longa (University of L'Aquila, L'Aquila)
12. • Ida Pettti (Sapienza University of Rome)
13. • Massimo Tomellini (Torvergata, Università di Roma 2)
14. • Lucia Capogna (CNR and Inst. Laue Langevin, Grenoble France)
15. • Paola Castrucci (University Tor Vergata, Roma)
16. • Mauro Missori (CNR Roma)
17. • Marco Girasole (CNR Frascati)
18. • Alessandro Arcovito (Cattolic University of Roma)
19. • Francesca Natali (CNR and ILL Grenoble, France)
20. • Michela Brunelli (ESRF, Grenoble)
21. • Sveva Grande (Ist. Sup. Sanità, Rome)
22. • Antonio Valletta (CNR Roma)
23. • Daniele Di Castro (Università di Roma 2, TorVergata, Roma)
24. • Alessandra Lanzara (full Prof. Berkeley University, Ca, USA)
25. • Naurang L. Saini (Ass prof. Sapienza University of Rome, Rome)
26. • Gaetano Campi (CNR Montelibretti, Roma)
27. • Stefano Agrestini (Max Planck Institute, Dresden)
28. • Laura Simonelli (ESRF, Grenoble)
29. • Valerio Palmisano (Holland)
30. • Matteo Filippi (Amsterdam)
31. • Nicola Poccia (MESA Twente)
32. • Alessandro Ricci (Desy Hamburg)

Chairman of international conferences

Superstripes and Phase separation
Superstripes 2102
Chaiman Antonio Bianconi
Ettore majorana Center, Erice July 11-17, 2012

Quantum phenomena in complexity
Superstripes 2011
8th International Conference of the Stripes Series,
Chaiman Antonio Bianconi
Roma July 15-22, 2011
Aula Magna, Università di Roma La Sapienza

Quantum phenomena in complex systems
International Conference of the Superstrips Series, SUPERSTRIPES 2010 conference
Chaiman Antonio Bianconi
Erice July 19-25, 2010
Ettore Majorana Center, Erice Italy

FeAs High Tc Superconducting Multilayers and Related Phenomena
7th International Conference of the Superstrips Series, Superstripes08
Chairman Antonio Bianconi
Roma December 9-13, 2008
Aula Magna, Università di Roma La Sapienza

Quantum Phenomena in Complex Matter
6th International Conference of the Stripes Series, STRIPES08
Chairman Antonio Bianconi
Erice: 26 July - August 1, 2008
Ettore Majorana Center, Erice Italy

Controlling Mesoscopic Phase Separation in Complex Materials
European Workshop (COMEPHS)
Chairman Antonio Bianconi
Roma, April 9-11, 2008
Department of Physics, Sapienza University of Roma

Quantum Phenomena in Complex Matter
5th International Conference of the Stripes Series, STRIPES06
Chairman Antonio Bianconi
Roma, December 17-22, 2006
Aula Magna, University of Roma "La Sapienza", Italy ,

Multiband superconductivity and interband pairing
Twenty Years from the Discovery of High Tc Superconductivity
Int. Workshop
Chairman Antonio Bianconi
Erice 20-26 July 2006
Ettore Majorana Center, Erice Italy

Ugo Fano Symposium
Ugo Fano and the Physics of XXI century
70 years (1935 - 2005) of research in shape resonances
Chairman Antonio Bianconi
Roma 4 Feb 2005
Aula Conversi Dipartimento di Fisica Università di Roma “La Sapienza

Nanoscale Heterogeneity in Condensed Matter Quantum Phenomena in Complex Electronic Matter
4th International Conference of the Stripes Series, STRIPES04
Chairman Antonio Bianconi
Roma , Sept. 26 - Oct. 2, 2004
Aula Magna, Università di Roma “La Sapienza”

Symmetry and Heterogeneity in High Temperature Superconductors

Gap symmetry and Interband pairing,
Nato Advanced Research Workshop
Erice-Sicily: 4-10 October 2003
Directed by Antonio Bianconi, Alexander F. Andreev and K Alex Müller
Ettore Majorana Center, Erice Italy

X-ray and Inner-Shell Processes
19th International Conference
Chairmen: Antonio Bianconi, Augusto Marcelli
Roma June 24-28, 2002
Aula Magna, Università di Roma "La Sapienza"

Artificial and Natural Nanostructures MgB_2 and Related Systems (ANN01)
International Symposium
Chaimen A, Banconi and N.L. Saini
Roma 10-12 Dicembre 2001
Aula Convegni, CNR, Piazzale Aldo Moro 8

Physics and Local Lattice Distorsion, fundamentals and new concepts (LLD2)
Chairmen: H. Oyanagi and A. Bianconi
Ibaraki, Japan, 23-26 July 2000
Electrotechnical Laboratory, Umezono, Tsukuba,

Stripes and High Tc Superconductivity
3rd International Conference of the Stripes Series, Stripes2000
Chaimen A. Bianconi, N.L. Saini
Roma September 25-30, 2000
Aula Magna, Università di Roma "La Sapienza"

Stripes and High Tc Superconductivity
2nd International Conference of the Stripes Series, Internazionale (STRIPES98)
Chaimen A, Banconi and N.L. Saini
Roma 2-6-giugno 1998
Aula Magna, Università di Roma "La Sapienza",

Stripes, Lattice Instabilities and High Tc Superconductivity
1st Conferenza Internazionale (STRIPES96)
Chaimen: Antonio Bianconi, K. Alex Müller
Roma, December 8-12-1996
Università di Roma "La Sapienza"

High Tc Superconductors: Electronic Structure
International Symposium,
Chairman: Antonio Bianconi, Augusto Marcelli
Rome, Italy, Oct. 5-7, 1988.
Accademia dei Lincei, Roma

Biophysics and Synchrotron Badiation
International conference,
Frascati 4-8 July 1988.
Chairman: Antonio Bianconi

Laboratory Nazionali di Frascati, Italy

EXAFS and near edge structure
International conference,
Frascati, Italy, September 13-17, 1982
Chaiman: Antonio Bianconi,
Villa Tuscolana, Frascati, Italy.

BOOKS

[1] A. Bianconi Symmetry and Heterogeneity in high temperature superconductors" *Nato Science Series II Mathematics, Physics and Chemistry* vol. 214 Spinger Dordrecht The Netherlands (2006). ISBN-10 1-4020-3987-5 (HB}

[2] A. Bianconi and A. Marcelli N. L. Saini X-ray and Inner Shell Processes, Editors, AIP Conf. Proceedings, Melville, New York 652, 497-506 (2003)

[3] H. Oyanagi and Antonio Bianconi "Physics and Local Lattice distorsion", American Institute of Physics, Melville, New York, 554, (2001

[4] A. Bianconi N. L. Saini Stripes and Related Phenomena, Kluwer Academic/Plenum publisher, New York, 9-25 (2000)

[5] A. Bianconi & A. Marcelli High T_c Superconductors: Electronic Structure Pergamon Press, Oxford, 1989

[6] A. Bianconi and A. Congiu Castellano Biophysics and Synchrotron Radiation Springer Series in Biophysics vol. 2 Springer Verlag, Berlin 1987

[7] Bianconi, L. Incoccia, and S. Stipcich EXAFS and Near Edge Structure Springer Series in Chemical Physics Springer Verlag, Berlin 1983

PATENTS

Antonio Bianconi, European Patent EP 733271 1993 : "High Tc superconductors made by metal heterostructures at the atomic limit" (published in European Patent. Bulletin 98/22, May 27 1998)) (priority date 7 Dec 1993),

Antonio Bianconi United State Patent No. :US 6265 019 B1, July 24, 2001 "Process of increasing the critical temperature Tc of a Bulk Superconductor by Making Metal Heterostructures at the Atomic Limit"
http://www.wikipatents.com/US-Patent-6265019/process-of-increasing-the-critical-temperature-tc-of-a-bulk

Agrestini, Stefano Bianconi, Antonio European free Patent EP 1447857 2003 A Sc1-xMgxB2 superconductors tuned at a shape resonance for Tc amplification http://www. freepatentsonline. com/EP1447857.html

A. Bianconi High Tc Superconductors Made by Metal Heterostructures at the Atomic Limit Japanese Patent No. 2868621 Dec 25 1998

Antonio Bianconi is:
1) member of the Editorial Board of the IOP Science Journal "*Superconductor Science and Technology*"
http://iopscience.iop.org/0953-2048/page/Editorial%20Board

2. Editor-in-Chief *of the journal "Life" http://www.mdpi.com/journal/life/editors*

3. member of the Editorial Board of the *of the journal Open Journal of Metal*
http://www.scirp.org/Journal/EditorialBoard.aspx?JournalID=784

4. Member of the European Academy of Sciences (Eurasc)

Field of interests:

synchrotron radiation research; complex oxides; quantum phenomena in complex matter; quantum confinement; superstripes in complex matter; lattice complexity in transition metal oxides; high Tc superconductors; valence fluctuation materials

Website: http://www.roma1.infn.it/stripes/Menu/007GroupHome/cards/cardBianco.html