Curriculum vitae

Andrea Bianco – Born in Milan, April, 4, 1975

EDUCATION
Graduation in Materials Engineering (grade 100/100) at Politecnico di Milano in 2000.
Ph.D. degree in Materials Engineering at the Politecnico di Milano in collaboration with the Astronomical Observatory of Brera in 2004. Title of dissertation: "New Organic Materials For Optical Elements in Astronomy".

EMPLOYMENT HISTORY
2001 – 2004 Ph.D. student at Politecnico di Milano;

2004 Visiting Scholar at University of Delaware (USA);

2005 PostDoc position at Politecnico di Milano;

2005 – 2010 Tenure track researcher at INAF-IASF (Istituto di Astrofisica Spaziale e Fisica Cosmica), Milano;

Since March 2010, full-time researcher at INAF – Osservatorio Astronomico di Brera.

RESEARCH INTERESTS
The research interests are addressed to the study and application of organic functional materials with peculiar optical properties and to the design, modeling and characterization of diffractive optical elements to be used in astronomical instrumentation.
In particular, the research activity regarding the organic functional materials, focuses on photochromic materials exploiting the changes of different physico-chemical properties, i.e. transparency, refractive index. Such changes can be applied in the development of rewritable phase and amplitude Holographic Optical Elements (HOEs). Amplitude Computer Generated Holograms has been used for the optical testing of aspheric lenses. The change in transparency has been also studied for developing variable filters in the visible and adaptable interferometers.
The research activity regarding the diffractive optics, focuses also on the design, manufacturing and characterization of Volume Phase Holographic Gratings based on photoactive materials, such as photopolymers.
Another research interest focuses on the electrospinning for the production of nanometric fibers. The interest started during the visiting period at the University of Delaware with Professor John Rabolt one of the pioneer of the technique. I used the electrospinning technique to make functional fibers with peculiar electrical properties.

RESEARCH PROJECTS PARTECIPATION
2004 – 2008 EU – FP6, OPTICON (Optical Infrared Co-ordination Network for astronomy) Joint Research Activities on Volume Phase Holographic Gratings.

2006 – 2007 Italian Scientific and Technological Ministry PRIN on Photochromic polymers as active materials for innovative reference surfaces for optical interferometry.

2007 UIT – Technological Transfer project on the development of a Cryogenic refractometer for the measurement of the refractive index of glasses with very good precision (PI of the project).

2008 – 2012 EU – FP7, OPTICON (Optical Infrared Co-ordination Network for astronomy), Joint Research Activities on New Materials for Astronomical Instrumentation.

2009 – 2011 National grant from INAF (Italian Institute of Astrophysics) for the "Feasibility and cost assessment of an extremely large Field of View spectrograph" (responsible of the design of

dispersing elements).

2010 – 2012 MITO (Materiali Innovativi per oTtiche Olografiche – Innovative Materials for Holographic Optics) in collaboration with regional companies (PI of the research activity).

2011-2013 National grant from INAF (Italian Institute of Astrophysics) for the "Development and test of new CGH-based techniques with automate calibration for future large-format adaptive-optics mirror" (Co-PI).

TEACHING ACTIVITY

30 settembre – 9 ottobre 2007. Lecturer at the XIII Scuola Nazionale di Scienza dei Materiali, INSTM. Topic: electrospinning.

13 - 17 Luglio 2007. Lecturer at the 13^{a} Scuola AIMAT "Tecnologie innovative di superficie e loro applicazioni". Topic: electrospinning.

Since 2005: Adjunct professor of "Metodi per la caratterizzazione microstrutturale dei materiali" (5 cfu) for Chmical Engineering and Materials Engineering at Politecnico di Milano.

From 2007 to 2010: Adjunct professor of "Methods for the microstructural characterization of materials" (5 cfu) for Chmical Engineering and Materials Engineering at Politecnico di Milano.

From 2004 to 2007: Support teaching activity for the class "Materiali Funzionali Organici", Prof. Chiara Bertarelli, for Material Engineering of Politecnico di Milano.

From 2004 to 2006: Support teaching activity for the class "Struttura dei materiali macromolecolari", Prof. Chiara Castiglioni for Material Engineering of Politecnico di Milano.

PUBLICATIONS

37 peer-reviewed publications on international journals, 35 Proceedings of SPIE and IEEE, one international patent. Total citations: 451, h-index: 12.

Selected papers:

[1] G. Pariani, R. Castagna, R. Menon, C. Bertarelli, A. Bianco, Modeling absorbance-modulation optical lithography in photochromic films, Opt. Lett., 38 (2013) 3024-3027.

[2] R. Castagna, M. Garbugli, A. Bianco, S. Perissinotto, G. Pariani, C. Bertarelli, G. Lanzani, Photochromic Electret: A New Tool for Light Energy Harvesting, Journal of Physical Chemistry Letters, 3 (2012) 51-57.

[3] G. Pariani, R. Castagna, G. Dassa, S. Hermes, C. Vailati, A. Bianco, C. Bertarelli, Diarylethene-based photochromic polyurethanes for multistate optical memories, Journal of Materials Chemistry, 21 (2011) 13223-13231.

[4] G. Pariani, A. Bianco, R. Castagna, C. Bertarelli, Kinetics of Photochromic Conversion at the Solid State: Quantum Yield of Dithienylethene-Based Films, Journal of Physical Chemistry A, 115 (2011) 12184-12193.

[5] G. Pariani, C. Bertarelli, G. Dassa, A. Bianco, G. Zerbi, Photochromic polyurethanes for rewritable CGHs in optical testing, Opt. Express, 19 (2011) 4536-4541.

[6] A. Bianco, S. Perissinotto, M. Garbugli, G. Lanzani, C. Bertarelli, Control of optical properties through photochromism: a promising approach to photonics, Laser & Photonics Reviews, 5 (2011) 711-736.

[7] C. Bertarelli, A. Bianco, R. Castagna, G. Pariani, Photochromism into optics: Opportunities to develop light-triggered optical elements, Journal of Photochemistry and Photobiology C: Photochemistry Reviews, 12 (2011) 106-125.

[8] N. Adami, D. Fazzi, A. Bianco, C. Bertarelli, C. Castiglioni, Enhancing the light driven

modulation of the refractive index in organic photochromic materials: A quantum chemical strategy, Journal of Photochemistry and Photobiology A-Chemistry, 214 (2010) 61-68.

[9] S. Hermes, G. Dassa, G. Toso, A. Bianco, C. Bertarelli, G. Zerbi, New fast synthesis route for symmetric and asymmetric phenyl-substituted photochromic dithienylethenes bearing functional groups such as alcohols, carboxylic acids, or amines, Tetrahedron Letters, 50 (2009) 1614-1617.

[10] G. Callierotti, A. Bianco, C. Castiglioni, C. Bertarelli, G. Zerbi, Modulation of the Refractive Index by Photoisomerization of Diarylethenes: Theoretical Modeling, J. Phys. Chem. A, 112 (2008) 7473-7480.