

PERSONAL INFORMATION **Alessandro D'Elia****Primary scientific area** Experimental condensed matter physics and material science.

The main focus of my research activity is the characterization of the electronics structure of technologically appealing quantum materials in particular oxides and chalcogenides.

POSITION **Assegnista di ricerca, LNF-INFN****WORK EXPERIENCE**

MARCH 3 - JUNE 2015 **Thesis traineeship at beamline B18 Diamond Light Source Synchrotron facility**

- Design and development of experimental set up for synchrotron radiation experiments
- Diamond supervisor: Dr Giannantonio Cibin

NOVEMBER 2016- 2019 **PhD student at Elettra synchrotron radiation (Gasphase beamline)**

- Experimental research with synchrotron radiation
- Synthesis of nanostructured transition metal oxide
- Supervisor : Dr. Marcello Coreno (ISM-CNR)

1 JULY 2020/31 MARCH 2021 **Postdoc at University of Cologne II Institute of Physics, Prof. Grüneis group**

- Synthesis and characterization of 2D materials (Transition metal dichalcogenides)
- Raman Spectroscopy
- Photoluminescence Spectroscopy
- Spin resolved ARPES

1 APRIL 2021/ONGOING **Assegno di ricerca, LNF-INFN, Dr. Claudio Gatti group**

- Development and use of superconducting devices for axion detection
- Study of exotic superconductors

EDUCATION AND TRAINING

SEPT. 2005-JULY 2010 **High school diploma**
 Liceo scientifico statale Antonio Labriola, Rome, Italy
 ▪ Valuation: 87\100

SEPT. 2010 - OCT. 2013 **Physics science Bachelor degree**
 Roma Tre University, Department of physics, Rome, Italy
 ▪ Thesis title: Spectroscopic characterization of metallic phthalocyanine
 ▪ Supervisor: Professor Alessandro Ruocco
 ▪ Valuation: 110\110

OCT. 2013 - OCT. 2016 **Physics Master degree**
 Roma Tre University, Department of physics, Rome, Italy
 ▪ Thesis title: Design and characterization of a device to optimize the XRD acquisition process of ultra-dilute sample
 ▪ Supervisor: Professor Augusto Marcelli
 ▪ Valuation: 109\110

NOV. 2016 - MARCH 2020 **Ph. D. in Nanotechnology**
 Trieste University, Trieste, Italy
 ▪ Thesis title: VO₂ a prototypical Phase Change Material: Spectroscopic study of the Orbital Contribution across the Metal-Insulator Transition
 Supervisor: Dr. Marcello Coreno

PERSONAL SKILLS
MOTHER TONGUE(S)

Italian

OTHER LANGUAGE(S)

	UNDERSTANDING		SPEAKING		WRITING
	LISTENING	READING	SPOKEN INTERACTION	SPOKEN PRODUCTION	
English	C1	C1	C1	C1	C1

COMMUNICATION SKILLS

Excellent comprehension of spoken English and speaking abilities acquired during my traineeship period, improved during my Ph. D and perfected during the Post-doc in Germany. A good communication is an essential skill to develop in order to handle international collaborations.

**ORGANISATIONAL /
MANAGERIAL SKILLS**

- Good sense of organization and optimization
- Design and development of experimental plans and experimental end stations

JOB-RELATED SKILLS

I have acquired the following abilities during my career:

Data acquisition and interpretation

- Acquisition, interpretation and analysis of XPS and UPS spectra
- Acquisition, interpretation and analysis of XANES spectra (L edges of Transition metals and O K edge) in total electron yield, partial electron yield and Auger yield
- Acquisition, interpretation and analysis of ResPes (Resonant photoemission) data
- Acquisition, interpretation and analysis of ARPES data
- Acquisition, interpretation and analysis of Resonant reflectivity data
- Acquisition, interpretation and analysis of Raman spectra
- Acquisition and interpretation of XRD data
- Acquisition and interpretation of Photoluminescence data
- Processing and analysis of VMI (Velocity map imaging) data.
- Processing and analysis of TOF (Time of flight) data.
- Data analysis for PEPICO (Photoelectron Photoion coincidence spectroscopy) experiments.
- Knowledge of Matlab for data analysis
- Knowledge of Igor for data analysis
- Knowledge of Python for data analysis

JOB-RELATED SKILLS***Laboratory skills***

- Handling with safety high-pressure gas instrumentation (gas reducer, swagelock, high-pressure gas bottle, gas lines etc.)
- Cryogenic treatment of sample with liquid He and N
- Handling and usage of Ultra High Vacuum instrumentation (experimental chamber, pumps, flanges etc.)
- 3D and 2D cad drawing of mechanical components (Included UHV components)

Miscellaneous

- Planning experimental activity over long term period
- Writing proposal for beam time at Synchrotron radiation facilities
- Writing experimental and activity reports
- Scientific papers writing
- Good knowledge of Microsoft Office tools (Excel, Word, Power Point)

OTHER SKILLS

- Team work, I've always worked in group
- Very quick learning
- Highly motivated and curious
- Proactive

PUBLICATIONS
Peer reviewed publication in scientific Journals

- 1. Design and characterization of a device to optimize the XRD acquisition process of ultra-dilute samples**
A. D'Elia; G. Cibir; P. E. Robbins; V. Maggi; A. Marcelli;

Nuclear Instruments and Methods in Physics Research B 411 (2017) 22–28;
 DOI: 10.1016/j.nimb.2017.03.061
- 2. Transmission diffractive patterns of large microchannel plates at soft X-ray energies**
 A. Marcelli, M. I. Mazuritskiy; S. B. Dabagov; A. M. Lerer; K. Dzedzic-Kocurek; A. Sokolov; M. Coreno; S. Turchini;
A. D'Elia; M. Sacchi

Nuclear Instruments and Methods in Physics Research B 402 (2017) 282–286;
 DOI: 10.1016/j.nimb.2017.02.075
- 3. Design and characterization of a device to optimize the XRD acquisition process of ultra-dilute samples**
A. D'Elia; G. Cibir; P. E. Robbins; V. Maggi; A. Marcelli;

Nuclear Instruments and Methods in Physics Research B 411 (2017) 22–28;
 DOI: 10.1016/j.nimb.2017.03.061
- 4. Nanoscale Phase Separation and Lattice Complexity in VO₂: The Metal–Insulator Transition Investigated by XANES via Auger Electron Yield at the Vanadium L₂₃-Edge and Resonant Photoemission**
 A. Marcelli, M. Coreno, M. Stredansky, W. Xu, C. Zou, L. Fan, W. Chu, S. Wei, A. Cossaro, A. Ricci, A. Bianconi and
A. D'Elia

Condensed Matter 2(4):38, (2017)
 DOI: 10.3390/condmat2040038
- 5. A new XUV optical end-station to characterize compact and flexible photonic devices using synchrotron radiation**
 A. Marcelli, M.I. Mazuritskiy, S.B. Dabagov, D. Hampai, A.M. Lerer, E.A. Izotova, A. D'Elia, S. Turchini, N. Zema, F. Zuccaro, M. de Simone, S. Javad Rezvani and M. Coreno

JINST 13 C03035, (2018)
 DOI: 10.1088/1748-0221/13/03/C03035
- 6. Coherent Excitation of X-Ray Fluorescence and Interference of Radiation at the Output of Polycapillary Structures**
 M. I. Mazuritskiy, A. M. Lerer, A. M. Lerer, A. Marcelli and A. D'Elia

JETP Letters, 107(10), (2018), 600-605
 DOI: 10.1134/S0021364018100132
- 7. Microdrop Deposition Technique: Preparation and Characterization of Diluted Suspended Particulate Samples**
 S. Macis, G. Cibir, V. Maggi, G. Baccolo, D. Hampai, B. Delmonte, A. D'Elia and A. Marcelli

Condensed Matter 3(3),21, (2018),
 DOI: 10.3390/condmat3030021
- 8. MoO₃ films grown on polycrystalline Cu: Morphological, structural, and electronic properties**
 S. Macis, C. Aramo, C. Bonavolontà, G. Cibir, A. D'Elia, I. Davoli, M. De Lucia, M. Lucci, S. Lupi, M. Miliucci, A. Notargiacomo, C. Ottaviani, C. Quaresima, M. Scarselli, J. Scifo, M. Valentino, P. De Padova, and A. Marcelli

Journal of Vacuum Science & Technology A 37, 021513 (2019);
 DOI: 10.1116/1.5078794

- 9. Synchrotron Radiation Research and Analysis of the Particulate Matter in Deep Ice Cores: An Overview of the Technical Challenges**
 G. Cibir, A. Marcelli, V. Maggi, G. Baccolo, D. Hampai, P. E. Robbins, A. Liedl, C. Polese, A. D'Elia, S. Macis, A. Grilli and A. Raco

Condens. Matter 2019, 4, 61;
 DOI:10.3390/condmat4030061
- 10. Complete characterization of phase and amplitude of bichromatic XUV light**
 M. Di Fraia, O. Plekan, C. Callegari, K. C. Prince, L. Giannessi, E. Allaria, L. Badano, G. De Ninno, M. Trovò, B. Diviaco, D. Gauthier, N. Mirian, G. Penco, P. Rebernik, S. Spampinati, C. Spezzani, G. Gaio, Y. Orimo, O. Tugs, T. Sato, K. L. Ishikawa, P. A. Carpeggiani, T. Csizmadia, G. Sansone, P. M. Kumar, A. D'Elia, T. Mazza, E. V. Gryzlova, A. N. Grum-Grzhimailo, D. You and K. Ueda,

Phys. Rev. Letter 123, 213904 (2019)
 DOI: 10.1103/PhysRevLett.123.213904
- 11. Photoionization of Acetylene Doped in Helium Nanodroplets by EUV Synchrotron Radiation**
 S. Mandal, R. Gopal, S. Krishnan, R. Richter, M. Coreno, M. Mudrich, H. Srinivas, A. D'Elia, B. Bapat, and V. Sharma

Springer Proceedings in Physics, Quantum Collisions and Confinement of Atomic and Molecular Species, and Photons (2019)
 DOI: 10.1007/978-981-13-9969-5_11
- 12. Strain Induced Orbital Dynamics Across the Metal Insulator Transition in Thin VO₂/TiO₂ (001) Films**
A. D'Elia, S. J. Rezvani, A. Cossaro, M. Stredansky, C. Grazioli, B. W. Li, C. W. Zou, M. Coreno, A. Marcelli

Journal of Superconductivity and Novel Magnetism, (2020)
 DOI:10.1007/s10948-019-05378-0
- 13. New Method for Measuring Angle-Resolved Phases in Photoemission**
 D. You, K. Ueda, E. V. Gryzlova, A. N. Grum-Grzhimailo, M. M. Popova, E. I. Staroselskaya, O. Tugs, Y. Orimo, T. Sato, K. L. Ishikawa, P. A. Carpeggiani, T. Csizmadia, M. Füle, G. Sansone, P. K. Maraju, A. D'Elia, T. Mazza, M. Meyer, C. Callegari, M. Di Fraia, O. Plekan, R. Richter, L. Giannessi, E. Allaria, G. De Ninno, M. Trovò, L. Badano, B. Diviaco, D. Gauthier, N. Mirian, G. Penco, P. Rebernik Ribic, S. Spampinati, C. Spezzani, G. Gaio, and K. C. Prince

Phys. Rev. X 10, 031070, (2020)
 DOI: 10.1103/PhysRevX.10.031070
- 14. Interplay among Work Function, electronic structure and stoichiometry in nanostructured vanadium oxides films**
A. D'Elia, C. Cepek, M. de Simone, S. Macis, B. Belec, M. Fanetti, P. Piseri, A. Marcelli, M. Coreno

PCCP, 22, 6282-6290, (2020)
 DOI:10.1039/D0CP00216J
- 15. Penning spectroscopy and structure of acetylene oligomers in He nanodroplets**
 S. Mandal, R. Gopal, M. Shcherbinin, A. D'Elia, H. Srinivas, R. Richter, M. Coreno, B. Bapat, M. Mudrich, S. R. Krishna, V. Sharma

PCCP, 22, 10149-10157 (2020)
 DOI: 10.1039/D0CP00689K
- 16. Engineering Porous Silicon Nanowires with Tuneable Electronic Properties**
 S. J. Rezvani, N. Pinto, R. Gunnella, A. D'Elia, A. Marcelli, A. Di Cicco

Condens. Matter, 5(4), 57, (2020)
 DOI: 10.3390/condmat5040057

- 17. Attosecond delays in photoionization studied with coherent-controlled FEL**
 D. You, K. Ueda, O. Tugs, Y. Orimo, T. Sato, K.L. Ishikawa, E.V. Gryzlova, E.I. Staroselskaya, A.N. Grum-Grzhimailo, P.A. Carpeggiani, T. Csizmadia, M. Füle, N.G. Harshitha, G. Sansone, P.K. Maroju, M. Meyer, T. Mazza, A. D'Elia, C. Callegari, M. Di Fraia, O. Plekan, L. Giannessi, E.M. Allaria, G. De Ninno, M. Trovò, L. Badano, B. Diviacco, D. Gauthier, N.S. Mirian, G.M. Penco, P.R. Rebernik, S. Spampinati, C. Spezzani, G. Gaio, K.C. Prince

*J. Phys.: Conf. Ser.*1412 112006, (2020)
 DOI:10.1088/1742-6596/1412/11/112006
- 18. Strain mediated Filling Control nature of the Metal-Insulator Transition of VO₂ and electron correlation effects in Nanostructured films**
A. D'Elia, C. Grazioli, A. Cossaro, B. Li, C. Zou, J. Rezvani, N. Pinto, A. Marcelli, M. Coreno

Applied Surface Scienc, 540, 148341 (2020)
 DOI: 10.1016/j.apsusc.2020.148341
- 19. Detection of Spin Polarized Band in VO₂/TiO₂(001) Strained Films via Orbital Selective Constant Initial State Spectroscopy**
A. D'Elia, C. Grazioli, A. Cossaro, B. Li, C. Zou, J. Rezvani, N. Pinto, A. Marcelli, M. Coreno

Condens. Matter, 5(4), 72, (2020)
 DOI: 10.3390/condmat5040072
- 20. Structural anisotropy in three dimensional macroporous graphene: A polarized XANES investigation**
 S. J. Rezvani, A. D'Elia, S. Macis, S. Nannarone, S. Lupi, F. Schütt, F. Rasch, R. Adelung, B. Lu, Z. Zhang, L. Qu, X. Feng, A. Romani Vázquez, A. Marcelli

Diamond and Related Materials (2020)
 DOI: 10.1016/j.diamond.2020.108171
- 21. Coincident angle-resolved state-selective EUV photoelectron spectroscopy of acetylene molecules: a candidate system for time-resolved dynamics**
 S. Mandal, R. Gopal, H. Srinivas, A. D'Elia, A. Sen, S. Sen, R. Richter, M. Coreno, B. Bapat, M. Mudrich, V. Sharma S. R. Krishnan

Faraday Discuss., (2021)
 DOI: 10.1039/D0FD00120A
- 22. Stoichiometry and disorder influence over electronic structure in nanostructured VO_x films**
A. D'Elia, S. J. Rezvani, N. Zema, F. Zuccaro, M. Fanetti, B. Belec, B. W. Li, C. W. Zou, C. Spezzani, M. Sacchi, A. Marcelli, M. Coreno

Journal of Nanoparticle Research, (2021)
 DOI: 10.1007/s11051-020-05130-z
- 23. Wave propagation and focusing of soft X-rays by spherical bent microchannel plates**
 M.I. Mazuritskiy, A.M. Lerer, A. Marcelli, S.B. Dabagov, M. Coreno, A. D'Elia, S.J. Rezvani

Journal of Synchrotron Radiation (2021)
 DOI: doi.org/10.1107/S1600577520016458

Article contribution

In the following a schematic list of the article in which I have contributed significantly to the experimental planning, data acquisition, data interpretation and article writing.

First name articles:

1, 11, 13, 17, 18, 21

Last name articles:

3, 5

Corresponding Author:

11, 13, 17, 18, 21

Metrics

h-factor = 7 (Google scholar)

5 (Web of science)

5 (Scopus)

Total times cited = Google scholar: 92

Web of Science: 65 (<https://publons.com/researcher/3198308/alessandro-delia/>)

Scopus: 63 (<https://www.scopus.com/authid/detail.uri?authorId=57203134980>)

Reviewer activity: 9 verified peer reviews (<https://publons.com/researcher/3198308/alessandro-delia/>)

updated: 09/05/2021

CONFERENCES

Poster:

- Nanoscale excitations in emergent materials - NEEM 2015, Rome 2015
- Time-resolved Photoelectron Spectroscopy from tabletop UV and HHG laser sources, Synchrotrons and FELs: experiments and challenges, Trieste 2017

Speaker:

- **FISMAT 2017-Italian national conference on condensed matter physics, 1-5 October 2017, Trieste:** Talk title: "Electronic and structural properties at the nanoscale across the Metal-Insulator transition in VO₂ thin films"
- **Quantum Complex Matter (QCM) workshop on nanostructures, spin orbit coupling, Metal-to-Insulator transitions, Rome, 4 January 2018.** Talk title: "Nanoscale electronic and structural properties across the metal-insulator transition in VO₂ thin films"
- **ISMANAM 2018, Rome, 2-6 July 2018.** Talk title: "Production and characterization of VO_x nanostructured thin films"
- **PTPC 2019 Beatenberg (Switzerland), 8-11 January 2019.** Talk title: "PEPICO investigation of free transition-metal oxide nanoparticles in a molecular beam through a novel multi-coincidence imaging setup"
- **Young Researcher Meeting 2019, 18-21 June 2019, Rome, Italy.** Talk title: "Synthesis of VO_x nanostructured films with tunable oxidation state for application: XPS and XANES investigation" (http://www.iphysnet.com/wp/wpcontent/uploads/2019/06/10YRM_Program_final_v2.pdf)
- **Superstripes 2019, 23-29 June 2019, Ischia, Italy.** Talk title: "Oxygen induced electronic structure modification of VO_x nanostructured films" (<https://www.superstripes.net/download/Final-Program-Superstripes2019.pdf>)
- **Divisione Chimica Fisica 2019, 1-4 July 2019, Rome, Italy.** Talk title: "Interplay between stoichiometry, 3d occupation and unoccupied DOS in vanadium oxides nanostructured films" (<http://congressodcf2019.it/wp-content/uploads/2019/06/PROGRAMMA.pdf>)
- **Quantum Complex Matter (QCM) 2020, Frascati, 18-12 June 2020.** Talk title: "Tunability of electronic structure and disorder of nanostructured VO_x with variable oxygen content"

Chairman:

- **ISMANAM 2018, Rome, 6 July session** (<http://ismanam2018.ism.cnr.it/wp-content/uploads/2018/06/ISMANAM2018-Conference-Programme-1.pdf>)
- **Superstripes 2019, Ischia, 28 June session** (<https://www.superstripes.net/download/Final-Program-Superstripes2019.pdf>)

- **Alessandro De Vita Award, January 2019:** (<http://web.units.it/dottorato/nanotecnologie/en/node/4030>)

PRIZES & AWARDS