

**UNIVERSITÀ DEGLI STUDI DI MILANO**

Selezione pubblica per n.1 posto di Ricercatore a tempo determinato ai sensi dell'art.24, comma 3, lettera a) della Legge 240/2010 per il settore concorsuale 02/D1 - FISICA APPLICATA, DIDATTICA E STORIA DELLA FISICA, settore scientifico-disciplinare FIS/07 - FISICA APPLICATA (A BENI CULTURALI, AMBIENTALI, BIOLOGIA E MEDICINA) presso il Dipartimento di Biotecnologie Mediche e Medicina Traslazionale, (avviso bando pubblicato sulla G.U. n. 30 del 14/04/2020) Codice concorso 4267

## **Alfio Lorenzo Torrisi**

### **CURRICULUM VITAE**

**INFORMAZIONI PERSONALI (NON INSERIRE INDIRIZZO PRIVATO E TELEFONO FISSO O CELLULARE)**

COGNOME	TORRISI
NOME	ALFIO
DATA DI NASCITA	01/09/1983

**PERSONAL INFO:**

Birth date: September 1<sup>st</sup>, 1983, Catania, Italy

Nationality: [Italian](#)

E-mail: [atorrisi83@gmail.com](mailto:atorrisi83@gmail.com)

Skype: [alfio\\_torrisi@hotmail.com](https://www.hotmail.com/alfio_torrisi)

LinkedIn: <https://www.linkedin.com/in/atorrisi/>

Website: <https://atorrisi83.wixsite.com/thescientist>

**EDUCATION:**

**04/09/2014 -**

**10/04/2017:** **Ph.D. in technical sciences**, in the discipline of Electronics, specialty in Optoelectronics at the Institute of Optoelectronics, Military University of Technology (IOE - MUT), Warsaw, Poland, Joint Agreement with Czech Technical University in Prague (CTU) under the EXTATIC (Extreme-ultraviolet and X-ray Training in Advanced Technologies for Interdisciplinary Cooperation) ERASMUS MUNDUS PROGRAMME.

Title of the Project: *"SXR and EUV nanoscale imaging using compact laser plasma light sources and Fresnel optics".*

**01/07/2013 -**

**16/10/2014:** **Professional Master's Programme** from Dept. of hygiene and public health, University of Catania, Italy. Master title: "Environmental Monitoring and mutagenic, carcinogenic and teratogenic risk assessment".

Title of the Project: *"Monitoring and evaluation of greenhouse gases and heavy metals in the industrial pole of Priolo (SR, Italy)".*

**01/10/2009 -**

**27/03/2013:** **M.Sc. in Applied Physics** from Department of Physics and Astronomy, University of Catania, Italy.

Thesis: “*Characterization and Analysis of Artistic-Cultural artifacts for their provenance and dating*”.

**15/07/2009 -**

**01/10/2002:** **B.Sc. in Physics** from Department of Physics and Astronomy, University of Catania, Italy.

Thesis: “*Laser ablation and mass spectrometry (LAMQS) for application in the field of Cultural Heritage*”.

## **SCIENTIFIC CAREER:**

**01/08/2019 – Up to now:**

*INFN associated, Section of Catania Group. V, on the CIMA project, under the supervision of Dr. M. De Napoli*

**01/04/2018 – Up to now:**

*Postdoc Researcher at Ústav jaderné fyziky AV ČR - Nuclear Physics Institute of the Czech Academy of Sciences, Rez, Hlavní Město, Praha, Czech Republic*

- Nanoparticle productions and characterizations by laser ablation
- Plasma produced by Laser-target and by Particle beams-target interactions
- Characterization of SiC detectors
- Cultural heritage investigations
- Experimental measurements of PIXE and RBS at the NPI-Tandetron laboratory of the CANAM infrastructure.

**04/09/2017- 16/03/2018:**

*UCL University College of London, Dept. of Medical Physics & Biomedical Engineering, London, United Kingdom.*

- Appointed at Grade 7 as Research Associate at the AXIm (Advances X-ray Imaging) group for X-ray Phase Contrast Imaging experiments.
- Development of a micrometric phase-contrast microscope equipment investigating oesophageal human tumours.

**01/06 – 31/08/2017:**

*CNR-IOM (Italian National Research Council - Istituto Officina dei Materiali), TASC laboratory, Area di Ricerca Elettra sychrotron, Basovizza (Trieste), Italy.*

- Scientific consultant for the project entitled: “*Feasibility and design of a table-top source in the XUV, based on gaseous plasma induced by IR laser radiation*”.

**2014-2017 (PhD) – 2017 up to now (Continuous collaboration):**

*Military University of Technology (MUT), Institute of Optoelectronics, Laser Matter Interaction Laboratories (LMI), Warsaw, Poland.*

- Quasi-monochromatic, compact, table-top extreme ultraviolet (EUV) microscope, at 13.8nm wavelength: optimization and characterization.
- High resolution imaging using EUV radiation and diffractive optics with sub-50nm spatial resolution.
- Investigations of influence of object thickness and source emission bandwidth on spatial resolution in EUV microscopy based on Fresnel zone plates.
- Soft X-ray (SXR) microscopy in the “water window” spectral range using a ns laser plasma SXR source based on a double stream nitrogen/helium gas-puff target and Fresnel zone plate optics with spatial resolution of 60nm.
- Development of a method based on Signal-to-Noise (SNR) measurements for optimization and characterization of SXR microscopy images and for characterization and benchmarking of various SXR imaging systems.
- Optical simulation of EUV optics.
- Characterization of laser-plasma sources employing Silicon and Silicon Carbide detectors.
- Tomography experiments
- NEXAFS spectroscopy

**2015-2016:**

*Czech Technical University (CTU), Faculty of Nuclear Science and Physical Engineering, Prague, Czech Republic.*

- Capillary discharge microscopy: setup preparation and preliminary images acquisition.

*Czech Technical University (CTU), Faculty of Biomedical Engineering, Kladno, Czech Republic.*

- Preparation of Biological samples for SXR/EUV imaging.

**20/01/2014 – 30/04/2014:**

*Internship at the Italian Consortium Environmental Protection (Consorzio Italiano Protezione Ambiente, CIPA, Ex S.S.114 Km. 139 c.p. 102 96010 Priolo (SR), Italy).*

- Monitoring of environmental pollution by Radio acoustic sounding system (RASS) and Sound detection and ranging (SODAR).
- Detection of chemical compounds emitted to the ground and of the relative atmospheric parameters.
- SKYNET simulation - predictive models of the pollutants distribution.

**2012-2013:**

University Internship

*Laser-Plasma Physics Laboratory, Dept. of Physics and Earth Sciences, University of Messina, Messina, Italy.*

- Laser Analysis employing a Nd:YAG laser coupled with Mass Quadrupole Spectrometry (LAMQS).
- Analysis of Characteristic X-Ray using compact X-ray Fluorescence instrumentation (XRF).
- Optical microscopy and Scan Electron Microscope (SEM) samples observation.

#### **2011-2013:**

University Internship:

*PH3DRA Laboratory (PHysics for Dating Diagnostic Dosimetry Research and Applications), Dept. of Physics and Astronomy, University of Catania, Catania, Italy.*

- Characterization measurements using Raman, XRF and Colorimetry technique.
- Advanced study of Scan Electron Microscope (SEM).

#### **CERTIFICATIONS:**

- SARA 2014 (Safe Applications of RAdiation and radionuclides), Hasselt University (Belgium), February 2014.
- Training Course for Radiation Protection, Istituto Nazionale di Fisica Nucleare (National Nuclear Physics Institute), INFN, Catania (Italy), November 2013.
- Cambridge English Certificate (B1 Level) – License Number: 0041673866, Oxford University, September 2013.

#### **PRACTICES, STUDIES, EXCHANGE and EXPERIMENTS ABROAD:**

**2015:** Joint experiment employing a capillary Discharge and Imaging Applications – Czech Technical University, CTU (Prague) (6 months).

#### **16/02–1/03/2013:**

Intensive Erasmus Program Certificate “Safe Applications of Radiation and Radionuclides – SARA 2014” (2 weeks) in Belgium - Cooperation in Higher Education on Radiological and Nuclear Engineering (CHERNE) Network.

Project coordinators: University CVUT (Prague), SCK-CEN (Belgian Nuclear Research Centre, Mol, Belgium), JRC-IMM (Joint Research Centre Institute for Reference Materials and Measurements, Geel - Belgium), Hasselt University (Diepenbeek - Belgium).

#### **UNIVERSITY PROFESSIONAL ACTIVITIES:**

- Organizer member and co-operator for the development of the web platform of the PPLA2017 (Plasma Physics by Laser Application 2017) conference, held at Messina University (Italy), 5-7 July 2017.
- Organizer member of the ALPS workshop (I workshop on Application of Laser-Plasma X-ray and EUV sources) workshop held at the Institute of Optoelectronics, MUT, in Warsaw (Poland) 6-9 July 2015.
- Organizer member of the EXTATIC workshop (Extreme-ultraviolet and X-ray Training in Advanced

Technologies for Interdisciplinary Cooperation) held at the Institute of Optoelectronics, MUT, in Warsaw (Poland) 20-24 October 2015.

## **PROJECTS:**

1. 19-02804S (GAČR) 2019-2021: *"Nanostructured heteroprocesses for chemiresistors"*. Co-investigator.
2. 18-07619S (GAČR) 2018-2020: *"Janus nanoparticles for catalysis and membrane processes"*. Co-investigator.
3. P108/12/G108 (GAČR Center of Excellence) 2012-2018: *"Preparation, modification and characterization of materials by radiation"* (Czech Academy of Sciences, June-December 2018). Co-investigator.
4. EPSRC (Engineering and Physical Science Research Council), Grant N. EP/P023231/1 entitled *"Improving the outcomes of oesophageal interventions through novel x-ray based imaging methods"*, 42 months, 2017, 2021 (co-investigator, September 2017 – March 2018). Principal Investigator: Prof. A. Olivo, UCL.  
<http://gow.epsrc.ac.uk/NGBOViewGrant.aspx?GrantRef=EP/P023231/1>  
<http://gtr.rcuk.ac.uk/projects?ref=EP%2FP023231%2F1>
5. Erasmus Mundus PhD Programme, 501-125/AT, entitled *"EXTATIC, X-ray and EUV nanoscale imaging using compact laser plasma light sources and Fresnel optics"*, 36 months, (executor as PhD candidate, 2014-2017). <http://www.extatic.eu/>. Supervisor: Prof. P.W. Wachulak, WAT, Warsaw (Poland); Co-supervisor: Prof. L. Pina, CTU, Prague (Czech Republic).
6. National Centre for Science Project entitled *"Water window" radiation for nanoimaging of biological objects and three-dimensional electron density reconstruction in bioengineering and material science applications*, funding received, number UMO-2015/17/B/ST7/03718, (Opus 9), 36 months, 2015-2017 (co-investigator). Principal Investigator: Prof. P. W. Wachulak, WAT, Warsaw (Poland).
7. National Centre for Research and Development (Narodowe Centrum Badań i Rozwoju) project in the frame of LIDER, 4<sup>th</sup> edition programme, entitled *"Extreme ultraviolet (EUV) Microscope with nanometer spatial resolution for applications in modern science and technology"*, award number LIDER/004/410/L-4/12/NCBR/2013, 36 months, 2013-2016 (co-investigator 2014-2016). Principal Investigator: Prof. P. W. Wachulak, WAT, Warsaw (Poland).  
<http://www.ztl.wat.edu.pl/zoplzm/lider/>.
8. Grant agreement number 654148, European Union's Horizon 2020 research and innovation program, *"LASERLAB-EUROPE IV– The Integrated Initiative of European Laser Research Infrastructures"*, 36 months, EU Framework Programme, 2015-2017 (co-investigator). Principal Investigator: Prof. P. W. Wachulak, WAT, Warsaw (Poland).
9. National Centre for Science Project entitled *"Microscopy in the extreme ultraviolet (EUV) and soft X-ray (SXR) region"*, award number DEC-2011/03/D/ST2/00296 (Sonata), 36 months (project leader), 2012-2015 (co-investigator, 2014-2015). Principal Investigator: Prof. P. W. Wachulak, WAT, Warsaw (Poland).
10. Grant agreement number 284464, PRUE 31-089, European Union, *"LASERLAB-EUROPE III– The Integrated Initiative of European Laser Research Infrastructures III"*, 36 months, EU Framework Programme, 2012-2015 (co-investigator, 2014-2015). Principal Investigator: Prof. P. W. Wachulak, WAT, Warsaw (Poland).

## **AWARDS:**

1. Travel Grant to attend at TriesteNext 2013, European Exhibition of Scientific Research, September 2013, Trieste, Italy.

2. 250 € travel grant to attend the Multinational Congress on Microscopy (MCM 2015), August 23-28, 2015, Eger, Hungary.
3. Best Poster Presentation Award at SNAIA2018 (Smart Nanomaterial Advances, Innovations and Applications2018), Paris (10-13 Dec. 2018) - Certificate + £ 50,00 from Royal Academy of Chemistry

### **PROFESSIONAL SOCIETIES:**

- SIF (Società Italiana di Fisica, Italian Physics Society) from 2010.
- Polish Society of Microscopy from 2015.
- European Microscopy Society from 2015.

### **METRICS:**

**GOOGLE SCHOLAR:** 89 publications, 315 citations, h-index 8 (*Updated at 16/04/2020*)

**SCOPUS:** 79 publications, 256 citations, h-index 7 (*Updated at 16/04/2020*)

**WEB OF SCIENCES:** 61 publications, 169 citations, h-index 6 (*Updated at 16/04/2020*)

### **PUBLICATIONS in REFEREED JOURNALS:**

1. L. Torrisi, A. Torrisi, M. Cutroneo, "Laser-generated ns plasma pulses characterized using SiC Schottky diode", Contributions to plasma physics, Early view e202000012 (2020). DOI: 10.1002/ctpp.202000012
2. L. Torrisi, M. Cutroneo, A. Torrisi, G. Di Marco, B. Fazio, L. Silipigni, "IR ns pulsed laser irradiation of Polydimethylsiloxane in vacuum", Vacuum **177** 109361 (2020). DOI: 10.1016/j.vacuum.2020.109361
3. L. Silipigni, G. Salvato, B. Fazio, G. Di Marco, E. Proverbio, M. Cutroneo, A. Torrisi, L. Torrisi "Temperature sensor based on IR-laser reduced graphene oxide", Journal of Instrumentation **15** (04), C04006 (2020). DOI: 10.1088/1748-0221/15/04/c04006
4. L. Torrisi, M. Rosinski, M. Cutroneo, A. Torrisi, J. Badziak, A. Zaras-Szydlowska, P. Parys, "Target normal sheath ion acceleration by fs laser irradiating metal/reduced graphene oxide targets", J. Instrum. **15** (03), C03056 (2020). DOI: 10.1088/1748-0221/15/03/c03056
5. A. Torrisi, M. Cutroneo, L. Torrisi and J. Vacik, "Biocompatible Nanoparticles production by pulsed Laser Ablation in Liquids", J. Instrum. **15** (03), C03053 (2020). DOI: 10.1088/1748-0221/15/03/c03053
6. M. Cutroneo, A. Torrisi, V. Ryukhtin, M. Dopita, L. Silipigni, A. Mackova, P. Malinsky, P. Slepicka, L. Torrisi "Polydimethylsiloxane containing gold nanoparticles for optical applications", J. Instrum. **15** (03), C03044 (2020). DOI: 10.1088/1748-0221/15/03/c03044
7. L. Torrisi, M. Cutroneo, A. Torrisi, G. Salvato, E. Proverbio, L. Silipigni, "Reduction of graphene oxide foils by IR laser irradiation in air", J. Instrum. **15** (03), C03006 (2020). DOI: 10.1088/1748-0221/15/03/c03006
8. M. Cutroneo, V. Havranek, A. Mackova, P. Malinsky, A. Torrisi, L. Silipigni, Z. Sofer, L. Torrisi, "Selective modification of electrical insulator material by ion micro beam for the fabrication of circuit elements", Radiat. Eff. Defects S. **175** (3-4), 307-317 (2020). DOI: 10.1080/10420150.2019.1701462

9. A. Torrisi, M. Cutroneo, V. Havranek, L. Torrisi, J. Vacík, "Linearity studies of HD-810 dosimeters by light ion beams", *Radiat. Eff. Defects S.*, **175** (3-4), 383-393 (2020). DOI: 10.1080/10420150.2019.1701469
10. G. Ceccio, P. Horák, A. Cannavò, A. Torrisi, V. Hnatowicz, J. Vacík, "Distribution of Lithium in Doped Nuclear Pores of Polyethylene Terephthalate by Neutron Depth Profiling", *Radiat. Eff. Defects S.*, **175** (3-4), 325-331 (2020). DOI: 10.1080/10420150.2019.1701464
11. L. Torrisi, V. Havranek, A. Torrisi, M. Cutroneo and L. Silipigni, "Laser and ion beams graphene oxide reduction for microelectronic devices", *Radiat. Eff. Defects S.*, **175** (3-4), 226-240 (2020). DOI: 10.1080/10420150.2019.1701456
12. L. Torrisi, A. Torrisi, M. Cutroneo, "Laser-generated ns plasma pulses characterized using SiC Schottky diode", *Contributions to plasma physics*, Early view e202000012 (2020). DOI: 10.1002/ctpp.202000012
13. G. Ceccio, A. Cannavò, P. Horák, A. Torrisi, V. Hnatowicz, P. Apel, J. Vacík, "Lithium encapsulation in etched nuclear pores in polyethylene terephthalate", *Nuclear Instruments and Methods B*, **469** 15 (2020). DOI: 10.1016/j.nimb.2020.02.029
14. L. Torrisi, M. Cutroneo, A. Torrisi, G. Salvato, E. Proverbio and L. Silipigni, "Reduction of graphene oxide foils by IR laser irradiation in Air", *J. Instrum.* **15** C03006 (2020). DOI: 10.1088/1748-0221/15/03/C03006.
15. L. Torrisi and A. Torrisi, "Gold nanoparticles for physics and bio-medicine applications", *Radiat. Eff. Defects S.* **175** 1-2 (2020). DOI: 10.1080/10420150.2020.1718132
16. J. Vacík, P. Horák, S. Bakardjieva, V. Bejsovec, G. Ceccio, A. Cannavò, A. Torrisi, V. Lavrentiev and R. Klie, "Ion sputtering for preparation of thin MAX and MXene phases", *Radiat. Eff. Defects S.* **175** 1-2 (2020). DOI: 10.1080/10420150.2020.1718142
17. L. Torrisi, M. Cutroneo, A. Torrisi, L. Silipigni and V. Havranek, "Small-field dosimetry based on reduced graphene oxide under MeV helium beam irradiation", *Radiat. Eff. Defects S.* **175** 1-2 (2020). DOI: 10.1080/10420150.2020.1718137
18. L. Torrisi, M. Rosinski, D. Terwinska, P. Tchorz, M. Cutroneo and A. Torrisi, "Ion acceleration from aluminium plasma generated by fs laser in different conditions", *Contributions to Plasma Physics*, Online early view e201900187 (2020). DOI: 10.1002/ctpp.201900187
19. M. Cutroneo, L. Torrisi, J. Badziak, M. Rosinsky, A. Torrisi, M. Fazio, Z. Sofer, R. Battger and S. Akhmadaliev, "Hybrid Graphene Based Material Promising Target in Laser Matter Interaction", *J. Instrum.* **15** (2020). DOI: 10.1088/1748-0221/15/01/C01021
20. L. Torrisi, L. Silipigni, A. Torrisi, M. Cutroneo, "Graphene oxide as a radiation sensitive material for XPS dosimetry", *Vacuum* **173**, 109175 (2020). DOI: 10.1016/j.vacuum.2020.109175
21. L. Torrisi, M. Cutroneo and A. Torrisi, "Protons and carbon ions acceleration in the target-normal-sheath-acceleration regime using low-contrast fs and metal-graphene targets", *Contributions to Plasma Physics* **60**, 1(2020). DOI: 10.1002/ctpp.201900076
22. R. Yatskiv, S. Tiagulskyi, J. Grym, J. Vanis, N. Basinova, P. Horak, A. Torrisi, G. Ceccio, J. Vacík, M. Vršata, "Optical and electrical characterization of CuO/ZnO heterojunctions", *Thin Solid Films* **693**, 137656 (2020). DOI: 10.1016/j.tsf.2019.137656
23. L. Torrisi, V. Havranek, M. Cutroneo, A. Torrisi, "Gafchromic HD-V2 investigations using MeV ion beams in vacuum", *Radiat. Eff. Defects S.* **174** (11-12), 1063-1075 (2019). DOI: <https://doi.org/10.1080/10420150.2019.1683845>.
24. L. Torrisi, L. Silipigni, V. Havranek, M. Cutroneo, A. Torrisi, G. Salvato, "Reduced graphene oxide foils for ion stripping applications", *Radiat. Eff. Defects S.* **174**(11-12), 973-984 (2019). DOI: 10.1080/10420150.2019.1683836

25. L. Torrissi, S. Guglielmino, L. Silipigni, L.M. De Plano, L. Kovacik, V. Lavrentiev, A. Torrissi, M. Fazio, B. Fazio, and G. Di Marco, "Study of gold nanoparticles transport by M13-phages towards disease tissues as targeting procedure for radiotherapy applications", *Gold Bulletin* **52**, 135–144 (2019). DOI: 10.1007/s13404-019-00266-w
26. A. Cannavò, V. Havránek, M. Cutroneo, G. Ceccio, A. Torrissi, P. Horák, J. Vacík, L. Torrissi, "Spectroscopy of backscattered Cu ions detected by CR39 through grayness analysis of ion-etch tracks", *Radiation Measurements* **129**, 106204 (2019). DOI: <https://doi.org/10.1016/j.radmeas.2019.106204>
27. L. Torrissi, M. Cutroneo, A. Torrissi, M. Rosinski, A. Zaras-Szydlowska, P. Parys, "Investigation of the effect of plasma waves excitation on target normal sheath ion acceleration using fs laser-irradiating hydrogenated structures", *Contributions to Plasma Physics* e201900029 (2019). DOI: 10.1002/ctpp.201800127
28. M. Cutroneo, V. Havranek, P. Malinski, S. Mackova, A. Torrissi, J. Flaks, P. Slepicka, and L. Torrissi, "Micro ion beam used to optimize the quality of microstructures based on polydimethylsiloxane", *Nuclear Instruments and Methods in Physics Research B* **459**, 137-142 (2019). DOI: 10.1016/j.nimb.2019.08.033
29. L. Torrissi, V. Havranek, M. Cutroneo, A. Mackova, L. Silipigni and A. Torrissi, "Characterization of reduced Graphene oxide films used as stripper foils in a 3.0-Mv Tandetron", *Radiation Physics and Chemistry* **165**, 108397 (2019). DOI: 10.1016/j.radphyschem.2019.108397
30. L. Torrissi, N. Restuccia and A. Torrissi, "Study of gold nanoparticles for mammography diagnostic and radiotherapy improvements", *Reports of Practical Oncology & Radiotherapy* **24**(5), 450-457 (2019). DOI: 10.1016/j.rpor.2019.07.005
31. L. Torrissi, V. Venuti, V. Crupi, L. Silipigni, M. Cutroneo, G. Paladini, A. Torrissi, V. Havránek, A. Macková, M. F. La Russa, G. Birarda, L. Vaccari, A. Macchia, F. Khalilli, M. Ricca, D. Majolino, "RBS, PIXE, Ion-Microbeam and SR-FTIR Analyses of Pottery Fragments from Azerbaijan", *Heritage*, **2**(3), 1852-1873 (2019). DOI: 10.3390/heritage2030113
32. L. Torrissi, M. Cutroneo, L. Silipigni, M. Fazio, A. Torrissi, "Effects of the Laser Irradiation on Graphene Oxide Foils in Vacuum and Air", *Physics of the Solid State* **61**(7), 1327-1331 (2019). DOI: 10.1134/S106378341907028X
33. L. Silipigni, G. Salvato, G. Di Marco, B. Fazio, A. Torrissi, M. Cutroneo, L. Torrissi, "Band-like transport in high vacuum thermal reduced graphene oxide films", *Vacuum* **165**, 254-261 (2019). DOI: <https://doi.org/10.1016/j.vacuum.2019.04.025>
34. M. Cutroneo, L. Torrissi, V. Havranek, A. Mackova, P. Malinsky, A. Torrissi, L. Silipigni, S. Fernandes, Z. Sofer, J. Stammers, "Localized modification of graphene oxide properties by laser irradiation in vacuum", *Vacuum* **165**, 134-138 (2019). DOI: <https://doi.org/10.1016/j.vacuum.2019.04.012>
35. L. Torrissi, M. Cutroneo and A. Torrissi, "Tantalum ion acceleration in laser-generated plasma and dependence on the pulse duration", *Contribution to Plasma Physics* **59**(9), e201900043 (2019). DOI: 10.1002/ctpp.201900043
36. A. Torrissi, P. W. Wachulak, L. Torrissi and H. Fiedorowicz, "Monitoring of the plasma generated by a gas-puff target source", *Physical Review Accelerator and Beams* **22**, 052901 (2019). DOI: 10.1103/PhysRevAccelBeams.22.052901
37. M. Cutroneo, L. Torrissi, V. Havranek, A. Mackova, P. Malinsky, A. Torrissi, J. Stammers, Z. Sofer L. Silipigni, B. Fazio, M. Fazio and R. Böttger, "Characterization of graphene oxide film by implantation of low energy copper ions", *Nuclear Instruments and Methods B* **460**, 169-174 (2019). DOI: <https://doi.org/10.1016/j.nimb.2019.03.021>
38. P. W. Wachulak, A. Torrissi, W. Krauze, A. Bartnik, J. Kostecki, M. Maisano, A. M. Sciortino, H. Fiedorowicz, "A "water window" tomography based on a laser-plasma double-stream gas-puff target soft X-ray source", *Applied Physics B* **125** (5), 70 (2019). DOI: <https://doi.org/10.1007/s0034>



39. M. Cutroneo, V. Havranek, A. Mackova, P. Malinsky, L. Torrissi, L. Silipigni, B. Fazio, A. Torrissi, K. Szokolova, Z. Sofer, J. Stammers, "Effects of the ion bombardment on the structure and composition of GO and rGO foils", *Materials Chemistry and Physics* **232** (15), 272-277 (2019). DOI: <https://doi.org/10.1016/j.matchemphys.2019.04.075>
40. A. Torrissi, P.W. Wachulak, H. Fiedorowicz and L. Torrissi, "SiC detectors for evaluation of laser-plasma dynamics employing gas-puff targets", *Nuclear Instruments and Methods A* **922** 250-256 (2019). DOI: [10.1016/j.nima.2018.12.086](https://doi.org/10.1016/j.nima.2018.12.086)
41. J. Vacik, V. Hnatowicz, V. Havranek, D. Fink, P. Apel, P. Horak, G. Ceccio, A. Cannavò, A. Torrissi, "Ion track etching in polyethylene-terephthalate studied by charge particle transmission technique", *Radiation Effects and Defects in Solids*, **174** (1-2), 148-157 (2019). DOI: [10.1080/10420150.2019.1579214](https://doi.org/10.1080/10420150.2019.1579214)
42. L. Torrissi and A. Torrissi, "Laser ablation of boron nitride in vacuum and in water", *Radiation Effects and Defects in Solids* **174** (1-2), 76-91 (2019). DOI: [10.1080/10420150.2019.1577850](https://doi.org/10.1080/10420150.2019.1577850)
43. L. Torrissi, M. Cutroneo, M. Rosinski, J. Badziak, P. Parys, J. Wołowski, A. Zaráś-Szydłowska and A. Torrissi, "Near 3 MeV protons from TNSA fs laser irradiating graphene targets" - Contributions to Plasma Physics (2019). DOI: [10.1002/ctpp.201800127](https://doi.org/10.1002/ctpp.201800127) (Online version: e201800127)
44. L. Torrissi, M. Cutroneo, A. Torrissi, L. Silipigni, G. Costa, M. Rosinski, J. Badziak, J. Wołowski, A. Zaráś-Szydłowska, P. Parys, "Protons accelerated in the target normal sheath acceleration regime by a femtosecond laser", *Phys. Rev. Accel. Beams* **22**(2), 021302 (2019). DOI: [10.1103/PhysRevAccelBeams.22.021302](https://doi.org/10.1103/PhysRevAccelBeams.22.021302)
45. L. Torrissi, M. Cutroneo, V. Havranek, L. Silipigni, B. Fazio, M. Fazio, A. Stassi and A. Torrissi, "Self-supporting graphene oxide films preparation and characterization methods", *Vacuum* **160** 1-11 (2019). DOI: [10.1016/j.vacuum.2018.11.001](https://doi.org/10.1016/j.vacuum.2018.11.001)
46. L. Torrissi and A. Torrissi, "Laser ablation parameters influencing gold nanoparticles synthesis in water", *Radiat. Eff. Defects S.* **173** 9-10 (2018). DOI: [10.1080/10420150.2018.1528598](https://doi.org/10.1080/10420150.2018.1528598)
47. G. Ceccio, A. Cannavò, P. Horak, A. Torrissi, I. Tomandl, V. Hnatowicz, and J. Vacik, "Measurement of Li diffusion in porous carbon by Neutron Depth Profiling" *Radiat. Eff. Defect S* **173** 9-10 (2018). DOI: [10.1080/10420150.2018.1528609](https://doi.org/10.1080/10420150.2018.1528609)
48. L. Torrissi, V. Havranek, M. Cutroneo, A. Mackova, L. Calcagno, A. Cannavò and A. Torrissi, "SiC detector for high helium energy spectroscopy", *Nuclear Instruments and Methods in Physics Research, Section B* **903**, 309-316 (2018). DOI: [10.1016/j.nima.2018.06.067](https://doi.org/10.1016/j.nima.2018.06.067)
49. P.W. Wachulak, A. Torrissi, M. Ayele, A. Bartnik, Ł. Węgrzyński, T. Fok, J. Czwartosz and H. Fiedorowicz, "Nanoimaging Using Soft X-Ray and EUV Sources Based on Double Stream Gas Puff Targets", *Acta Phys. Pol. A* **133**, 2 (2018), 271-276. DOI: [10.12693/APhysPolA.133.271](https://doi.org/10.12693/APhysPolA.133.271)
50. P.W. Wachulak, A. Torrissi, M. Ayele, J. Czwartosz, A. Bartnik, Ł. Węgrzyński, T. Fok, T. Parkman, S. Salacova, J. Turnova, M. Odstřil and H. Fiedorowicz, "Bioimaging using full field and contact EUV and SXR microscopes with nanometer spatial resolution", *Applied Sciences* **7**, 548 (2017). DOI: [10.3390/app7060548](https://doi.org/10.3390/app7060548)
51. A. Torrissi, P.W. Wachulak, A. Bartnik, T. Fok, Ł. Węgrzyński, H. Fiedorowicz, M. Mazzillo, A. and L. Torrissi, "Calibration of SiC detectors for Nitrogen and Neon plasma emission using gas-puff target sources", *IEEE – Transaction on electron devices* **64**, 3 (2017). DOI: [10.1109/TED.2017.2647780](https://doi.org/10.1109/TED.2017.2647780)
52. P.W. Wachulak, A. Torrissi, A. Bartnik, Ł. Węgrzyński, T. Fok and H. Fiedorowicz, "A desk-top extreme ultraviolet microscope based on a compact laser-plasma light source", *Applied Physics B* **123**, 25 (2017). DOI: [10.1007/s00340-016-6595-5](https://doi.org/10.1007/s00340-016-6595-5)

53. A. Torrisi, P.W. Wachulak, A. Bartnik, Ł. Węgrzyński, T. Fok and H. Fiedorowicz, "Biological and material science applications of EUV and SXR nanoscale imaging systems based on double stream gas puff target laser plasma sources", *Nuclear Instruments and Methods in Physics Research, Section B* **411** (29-34) (2017). DOI: 10.1016/j.nimb.2017.01.035
54. A. Torrisi, P. W. Wachulak, Ł. Węgrzyński, T. Fok, A. Bartnik, B. Jankiewicz, B. Bartosewicz and H. Fiedorowicz, "A stand-alone compact EUV microscope based on gas-puff target source", *Journal of Microscopy*, *Journal of Microscopy*, **256**, 2, 251-260 (2017). DOI: 10.1111/jmi.12494
55. L. Torrisi, A. Italiano and A. Torrisi, "Ancient bronze coins from Mediterranean basin: LAMQS potentiality for lead isotopes comparative analysis with former mineral", *Applied Surface Sciences*, **387**, 529-238 (2016). DOI: 10.1016/j.apsusc.2016.06.153
56. M.F. Nawaz, M. Nevrla, A. Jancarek, A. Torrisi, T. Parkman, J. Turnova, L. Stolcova, M. Vrbova, J. Limpouch, L. Pina and P. Wachulak, "Table-top water-window soft X-ray microscope using a Z-pinching capillary discharge source", *J. Instrum.* **11**, P07002 (2016). DOI:10.1088/1748-0221/11/07/P07002
57. A. Torrisi, P. W. Wachulak, L. Torrisi, A. Bartnik, Ł. Węgrzyński and H. Fiedorowicz, "Plasma characterization of the gas-puff target source dedicated for soft X-ray microscopy using SiC detectors", *Nukleonika* **61**, 2, 139-143 (2016). DOI: 10.1515/nuka-2016-0024
58. M. Rosinski, J. Badziak, P. Parys, A. Zaras-Szydlowska, L. Ryc, L. Torrisi, A. Szydlowski, A. Malinowska, B. Kaczmarczyk, J. Makowski and A. Torrisi, "Acceleration of protons in plasma produced from a thin plastic or aluminum target by a femtosecond laser", *J. Instrum.* **11**, C05017 (2016). DOI: 10.1088/1748-0221/11/05/C05017
59. A. Torrisi, P. W. Wachulak, M. Fahad Nawaz, A. Bartnik, Ł. Węgrzyński, A. Jancarek and H. Fiedorowicz, "Characterization and optimization of images acquired by a compact soft X-ray microscope based on a double stream gas-puff target source", *J. Instrum.* **11**, C04003 (2016). DOI: 10.1088/1748-0221/11/04/C04003
60. L. Torrisi, J. Badziak, M. Rosinski, A. Zaras-Szydlowska, M. Pfeifer and A. Torrisi, "Resonant absorption effects induced by polarized laser light irradiating thin foils in the tnsa regime of ion Acceleration", *J. Instrum.* C04008 (2016). DOI: 10.1088/1748-0221/11/04/C04008
61. A. Torrisi, P. W. Wachulak, M. Fahad Nawaz, A. Bartnik, D. Adjei, Š. Vondrová, J. Turňová, A. Jančarek and H. Fiedorowicz, "Applications of a compact "water window" source for investigations of nanostructures using SXR microscope", *Acta Phys. Pol. A* **129**, 2, 169-171 (2016). DOI: 10.12693/APhysPolA.129.169
62. P. Wachulak, A. Torrisi, M. F. Nawaz, A. Bartnik, D. Adjei, Š. Vondrová, J. Turňová, A. Jančarek, J. Limpouch, M. Vrbová and H. Fiedorowicz "A Compact "Water Window" Microscope with 60 nm Spatial Resolution for Applications in Biology and Nanotechnology", *Microscopy and Microanalysis* **21**, 5, 1214-1223 (2015). DOI: 10.1017/S1431927615014750
63. P. W. Wachulak, A. Torrisi, A. Bartnik, Ł. Węgrzyński, T. Fok, R. Jarocki, J. Kostecki, M. Szczurek and H. Fiedorowicz "Fresnel zone plate telescope for condenser alignment in water-window microscope", *Journal of Optics* **17**, 5, 055606 (2015). DOI:10.1088/2040-8978/17/5/055606
64. P. W. Wachulak, A. Torrisi, A. Bartnik, D. Adjei, J. Kostecki, L. Wegrzynski, R. Jarocki, M. Szczurek and H. Fiedorowicz, "Desktop water window microscope using a double-stream gas puff target source", *Applied Physics B* **118**, 573-578 (2015). DOI 10.1007/s00340-015-6044-x
65. A. Torrisi, M. Cutroneo, E.D. Castrizio and L. Torrisi, "Laser ablation coupled to mass quadrupole spectrometry for analysis in the cultural heritage", *Journal of Physics Conf. Ser.* **508**, 012025 (2014). DOI: 10.1088/1742-6596/508/1/012025

66. M. Cutroneo, L. Torrisci, L. Calcagno and A. Torrisci, "Characterization of thin films for TNSA laser irradiation", Journal of Physics Conf. Ser. **508**, 012025 (2014).  
DOI:10.1088/1742-6596/508/1/012012
67. L. Torrisci, A. Italiano, M. Cutroneo, C. Gentile and A. Torrisci, "Silver Coins Analyses by X-Ray Fluorescence Methods", Journal of X-Ray Science and Technology **21**, 381-390 (2013).  
DOI: 10.3233/XST-130389
68. L. Torrisci, F. Caridi, L. Giuffrida, A. Torrisci, G. Mondio, T. Serafino, M. Caltabiano, E.D. Castrizio, E. Paniz, M. Romeo and A. Salici, "LAMQS and XRF analyses applied to ancient Egyptian bronze coins", Rad. Eff. And Def. In Solids **165**(6-10), 626-636 (2010).  
DOI: 10.1080/10420151003729508
69. L. Torrisci, F. Caridi, L. Giuffrida, A. Torrisci, G. Mondio, T. Serafino, M. Caltabiano, E.D. Castrizio, E. Paniz and A. Salici, "LAMQS analyses applied to ancient Egyptian bronze coins", Nucl. Instr. And methods B **268**, 1657– 1664 (2010).  
DOI: 10.1016/j.nimb.2010.03.015
70. L. Torrisci, G. Mondio, A.M. Mezzasalma, D. Margarone, F. Caridi, T. Serafino, and A. Torrisci, "Laser and electron beams physical analyses applied to the comparison between two silver tetradrachm greek coins", The European Physical Journal D, **54** (2), 225-232 (2009).  
DOI: 10.1140/epjd/e2008-00240-x

#### **PEER-REVIEWED CONFERENCE PROCEEDINGS:**

1. L. Torrisci, A. Cassisa, L. Silipigni, M. Cutroneo and A. Torrisci, "Nanoparticles: Production, Characterization and Applications", VI Workshop Plasmi Sorgenti Fisica e Applicazioni, PSBA 2018, 14-15 Dec. 2018 Università del Salento, Lecce, Italy (2020)
2. A. Torrisci, W. Krauze, A. Bartnik, J. Kostecki, M. Maisano and H. Fiedorowicz, "Tomographic imaging with the use of a compact soft X-ray microscope based on a laser plasma light source", Proc. of SPIE, Conf. EOO19, Optics+Optoelectronics, Prague (Czech Rep.), 1-4 Apr 2019 - Proceedings Volume 11032, EUV and X-ray Optics: Synergy between Laboratory and Space VI; 110320N (2019).  
DOI: 10.1117/12.2527310
3. A. Torrisci P.W. Wachulak, H. Fiedorowicz and L. Torrisci, "Silicon carbide detectors for diagnostics of laser-produced plasmas", Proc. of SPIE, Conf. EOO19, Optics+Optoelectronics, Prague (Czech Rep.), 1-4 Apr 2019 - Proceedings Volume 11032, EUV and X-ray Optics: Synergy between Laboratory and Space VI; 110320W (2019). DOI: 10.1117/12.2527311
4. A. Torrisci, M. Cutroneo, G. Ceccio, A. Cannav, P. Horak, L. Torrisci and J. Vacik, "Laser-generated nanoparticles to change physical properties of solids, liquids and gases", Conference Proceedings, 10th Anniversary International Conference on Nanomaterials (17-19 Oct 2018, Brno, Czech Rep.) - Research and Application 2019, Pages 637-646
5. G. Ceccio, A. Cannavò, P. Horak, A. Torrisci, I. Tomandl, V. Hnatowicz and J. Vacik, "Study of lithium encapsulation in porous membrane using ion and neutron beams", Conference Proceedings, 10th Anniversary International Conference on Nanomaterials (17-19 Oct 2018, Brno, Czech Rep.) - Research and Application 2019, Pages 701-706
6. A. Cannavò, V. Havránek, V. Lavrentiev, L. Torrisci, M. Cutroneo, G. Ceccio, A. Torrisci, P. Horak, J. Vacik, "Production and characterization of micro-size pores for ion track etching applications", Conference Proceedings, 10th Anniversary International Conference on Nanomaterials (17-19 Oct 2018, Brno, Czech Rep.) - Research and Application 2019, Pages 652-658
7. V. Bejsovec, A. Cannavò, G. Ceccio, V. Hnatovicz, P. Horak, V. Lavrentiev, A. Macková, I. Tomandl, A. Torrisci and J. Vacik, "Instrumentation for study of nanomaterials in NPI Rez", Conference Proceedings, 10th Anniversary International Conference on Nanomaterials (17-19 Oct 2018, Brno, Czech Rep.) - Research and Application 2019, Pages 730-735

8. P.W. Wachulak, A. Torrisi, M. Ayele, J. Czwartos, A. Bartnik, R. Jarocki, J. Kostecki, M. Szczurek, Ł. Węgrzyński and H. Fiedorowicz, "Nanoscale Imaging using a Compact Laser Plasma Source of Soft X-rays and Extreme Ultraviolet (EUV)", Proc. of the 15th International Conference on X-ray Lasers (ICXRL 2016), Nara (Japan, 22-26 May 2016) – pp. 251-260 (2018), ISBN 978-3-319-73025-7
9. A. Torrisi, P.W. Wachulak, A. Bartnik, Ł. Węgrzyński, T. Fok, and H. Fiedorowicz, "Development and optimization of a "water window" microscope based on a gas-puff target laser-produced plasma source", European Physical Journal Web Conferences **167**, 03002 (2018). DOI: 10.1051/epjconf/201816703002
10. P.W. Wachulak, A. Torrisi, M. Ayele, A. Bartnik, J. Czwartos, Ł. Węgrzyński, T. Fok and H. Fiedorowicz, "Nanoimaging using soft X-ray and EUV laser-plasma sources", European Physical Journal Web Conferences **167**, 03001 (2018). DOI: 10.1051/epjconf/201816703001
11. P.W. Wachulak, A. Torrisi, M. Ayele, A. Bartnik, J. Czwartos, Ł. Węgrzyński, T. Fok, T. Parkman, Š. Vondrová, J. Turňová and H. Fiedorowicz, "Soft X-ray imaging with incoherent sources", Proc. of SPIE 10243, 102430O-1 (2017). DOI: 10.1117/12.2265093
12. P.W. Wachulak, A. Torrisi, A. Bartnik, Ł. Węgrzyński, T. Fok and H. Fiedorowicz, "Nanoscale imaging applications of soft X-ray microscope based on a gas-puff target source", Journal of Physics: Conference Series **849**, conference 1(2017). DOI: 10.1088/1742-6596/849/1/012050
13. P.W. Wachulak, A. Torrisi, A. Bartnik, Ł. Węgrzyński, T. Fok, Z. Patron and H. Fiedorowicz, "Soft X-ray microscope with nanometer spatial resolution and its applications", Proc. of SPIE STL, XI Sympozjum Techniki Laserowej, Jastarnia (Poland), 27-30 September 2016 – Laser Technology 2016, Proc. of SPIE 10159, 101590W-1. DOI: 10.1117/12.2259877
14. H. Fiedorowicz, A. Bartnik, P.W. Wachulak, R. Jarocki, J. Kostecki, M. Szczurek, D. Adjei, I.U. Ahad, M.G. Ayele, T. Fok, A. Szczurek, A. Torrisi and Ł. Węgrzyński, "Laboratory sources of soft X-rays and extreme ultraviolet (EUV) based on laser plasmas produced with a gas puff target" Materiały XI Krajowego Sympozjum Użytkowników Promieniowania Synchrotronowego, 1-4.09.2015, Chorzów, Bulletin of the Polish Synchrotron Radiation Society **14**, 1-2 (2015)
15. P. W. Wachulak, A. L. Torrisi, M. F. Nawaz, D. Adjei, A. Bartnik, J. Kostecki, Ł. Węgrzyński, Š. Vondrová, J. Turňová, T. Fok, A. Jančárek and H. Fiedorowicz, "A compact "water-window" microscope with 60 nm spatial resolution based on a double stream gas-puff target and Fresnel zone plate optics", Proc. of SPIE 9510, EUV and X-ray Optics: Synergy between Laboratory and Space IV, 95100M-95100M-8 (2015). DOI: 10.1117/12.2181431
16. A. Torrisi, P. Wachulak, F. Nawaz, A. Bartnik, J. Kostecki, L. Węgrzyński, R. Jarocki, M. Szczurek and H. Fiedorowicz, "Nanoscale imaging and optimization of a compact "water window" SXR microscope", Proc. of SPIE 9510, EUV and X-ray Optics: Synergy between Laboratory and Space IV, 95100N-95100N-11 (2015). DOI: 10.1117/12.2181436
17. A. Bartnik, P. Wachulak, R. Jarocki, J. Kostecki, M. Szczurek, D. Adjei, I. U. Ahad, M. G. Ayele, T. Fok, A. Szczurek, A. Torrisi, Ł. Węgrzyński and H. Fiedorowicz, "Laser plasma sources of soft X-rays and extreme ultraviolet (EUV) for application in science and technology", Proc. of SPIE 9510, EUV and X-ray Optics: Synergy between Laboratory and Space IV, 95100Q (May 12, 2015). DOI:10.1117/12.2182167
18. A. Torrisi, A. Grillo, V. Bellini and P. Finocchiaro, "The CATANA Proton Therapy Facility at LNS Catania: An ALARA Approach", Safe Application of Radiation and radionuclides SARA, Final Report on the ALARA Workshop, CHERNE Project 2014, Mol, Belgium . DOI: 10.13140/2.1.1787.3920 (2014)
19. L. Torrisi, A. Cannavò, L. Calcagno and A. Torrisi, "SiC detectors for fast diagnostic of high intensity laser-generated plasmas", IV<sup>o</sup> Workshop on Plasma, Sources and Biophysics Applications (PSBA 2014), Lecce (Italy), 17th-18th October, 2014. DOI: 10.1285/i9788883051081p69

20. L. Torrissi, G. Ceccio, M. Cutroneo and A. Torrissi "Metallic nanoparticles in thin foils for laser ion acceleration", IV<sup>o</sup> Workshop on Plasma, Sources and Biophysics Applications (PSBA 2014), Lecce (Italy), 17th-18th October, 2014. DOI: 10.1285/i9788883051081p48
21. A. Torrissi, M. Cutroneo, E. D. Castrizio and L. Torrissi, "Laser ablation coupled to mass quadrupole spectrometry for analysis in the cultural heritage", Workshop on Plasma Physics by Laser and Applications 2013 (PPLA 2013), Dept. of Physics of the University of Salento, Lecce (Italy), 2nd-4th October, 2013, Journal of Physics: Conference Series Volume 508 ISBN: 978-1-63439-288-4 (2013)
22. A. Italiano, L. Torrissi, M. Cutroneo, C. Gentile and A. Torrissi, "A comparative analysis of old and recent Ag coins by XRF methodology", III Workshop on Plasma, Sources, Biophysics Applications Dept. of Physics of the University of Salento, Lecce (Italy), 19th October, 2012. DOI: 10.1285/i9788883051029p23
23. A. Torrissi, L. Giuffrida, F. Caridi, T. Serafino, E.D. Castrizio, G. Mondio and L. Torrissi, "Laser Ablation Coupled to Mass Quadrupole Spectrometry (LAMS) applied to the Cultural Heritage", YOCOCU 2010 (Youth in COnservation of CUltural heritage), ISBN 978-88-97484-01-1, pp 223-230, ed. IA-CS (2010)
24. L. Torrissi, G. Mondio, T. Serafino, F. Caridi, A. Borrielli, D. Margarone, L. Giuffrida and A. Torrissi, "LAMQS, EDXRF and SEM analyses of old coins", I Workshop on Plasma, Sources, Biophysics and Applications Dept. of Physics of the University of Salento, Lecce (Italy), 9th October, 2008. DOI: 10.1285/i9788883050718p30

#### **CONFERENCE ABSTRACTS, TALKS and POSTER PRESENTATIONS:**

1. A. Torrissi, P. Horak, A. Cannavò, G. Ceccio, J. Vacik, J. Grim, J. Vanis and R. Yatskiv, "Multilayered Cu-Ti deposition on silicon substrates for chemiresistor applications", PBSi2019, Roma (Italy), 2-4 Dec. 2019 – POSTER
2. A. Torrissi, P. Wachulak, H. Fiedorowicz and L. Torrissi, "Characterization of Si and SiC detectors for laser-generated plasma monitoring in short wavelength range", PPLA 2019, Pisa (Italy), 29-31 Oct. 2019 – INVITED TALK
3. A. Torrissi, M. Cutroneo, L. Torrissi and J. Vacik, "Biocompatible Nanoparticles production by laser ablation in liquids", PPLA 2019, Pisa (Italy), 29-31 Oct. 2019 – POSTER
4. G. Ceccio, S. Trusso, A. Cannavò, P. Horak, A. Torrissi, J. Vacik, P. Apel, S. Bakardjieva, J. Šubrt, "Ion transmission spectroscopy of pores filled with the Au nanoparticles", IBA 2019, Antibes (France), 13-18 Oct 2019.
5. A. Cannavò, J. Vacík, V. Hnatowicz, G. Ceccio, P. Horák, A. Torrissi, U. Koster, G. Pasold, "Study of Li diffusion in thin film of Re annealed at high temperatures", ECASIA 2019, Dresden (Germany), 15-20 Sept. 2019.
6. A. Torrissi, P. Horak, A. Cannavò, G. Ceccio, J. Vacik, J. Fara, P. Fittl, J. Vlcek and M. Vrnata, "J Preparation of heterogenous copper titanium oxides for chemiresistor applications", E-MRS 2019 Fall, Warsaw (Poland), 13-16 Sept. 2019 – POSTER
7. G. Ceccio, S. Bakardjieva, P. Horak, J. Vacik, A. Cannavò, V. Lavrentiev, A. Torrissi, A. Michalcova, R. Klie, X. Rui, L. Calcagno, "Effect of Ar<sup>+</sup> irradiation of Ti<sub>2</sub>InC at different ion beam fluences", SMMIB 2019, Tomsk (Russia), 25-30 Aug. 2019
8. M. Cutroneo, V. Havranek, P. Malinsky, A. Mackova, A. Torrissi, J. Flaks, P. Slepicka, L. Silipigni, L. Torrissi, "Compositional, morphological and optical modifications in polydimethylsiloxane irradiated by micro ion beam", ECAART13, Split (Croatia), 5-10 May 2019.
9. P. Horak, G. Ceccio, A. Cannavò, A. Torrissi, J. Vacik, S. Bakardjieva, X. Rui, R. Klie "Synthesis of the Ti<sub>2</sub>C MXene by ion beam sputtering and an effect of ion irradiation on its microstructure", ECAART13, Split (Croatia), 5-10 May 2019.

10. P.W. Wachulak, A. Torrisi, W. Krauze, A. Bartnik, J. Kostecki, M. Maisano and H. Fiedorowicz, "Tomographic imaging with the use of a compact soft X-ray microscope based on a laser plasma light source", SPIE, Conf. EOO19, Optics+Optoelectronics, Prague (Czech Rep.), 1-4 Apr 2019 – TALK
11. A. Torrisi P.W. Wachulak, H. Fiedorowicz and L. Torrisi, "Silicon carbide detectors for diagnostics of laser-produced plasmas", SPIE, Conf. EOO19, Optics+Optoelectronics, Prague (Czech Rep.), 1-4 Apr 2019 - POSTER
12. A. Torrisi, M. Cutroneo, L. Torrisi and J. Vacik, "Metallic nanoparticles by pulsed laser ablation in water", SNAIA 2018, Paris, France, 10-13 December 2018 - POSTER
13. P. Wachulak, M. Duda, A. Torrisi, A. Bartnik, M. Ayele, Ł. Węgrzyński, T. Fok, A. Sarzyński, A. Jancarek and H. Fiedorowicz, "Applications of laser-plasma double stream gas puff target sources of the EUV and SXR radiation", Workshop "Visions on Future Laser-based X-ray Science and Technology", Barcelona, Spain, 19-20 November 2018
14. A. Torrisi, M. Cutroneo, G. Ceccio, A. Cannavò, P. Horak, L. Torrisi and J. Vacik, "Laser-generated nanoparticles to change physical properties of solids, liquids and gases", NANOCON2018, Brno, Czech Rep., 17-19 Oct 2018 - POSTER
15. G. Ceccio, A. Cannavò, P. Horak, A. Torrisi, I. Tomandl, V. Hnatowicz and J. Vacik, "Study of lithium encapsulation in porous membrane using ion and neutron beams", NANOCON2018, Brno, Czech Rep., 17-19 Oct 2018.
16. A. Cannavò, V. Havránek, V. Lavrentiev, L. Torrisi, M. Cutroneo, G. Ceccio, A. Torrisi, P. Horak, J. Vacik, "Production and characterization of micro-size pores for ion track etching applications", NANOCON2018, Brno, Czech Rep., 17-19 Oct 2018.
17. V. Bejsovec, A. Cannavò, G. Ceccio, V. Hnatowicz, P. Horak, V. Lavrentiev, A. Macková, I. Tomandl, A. Torrisi and J. Vacik, "Instrumentation for study of nanomaterials in NPI Rez", NANOCON2018, Brno, Czech Rep., 17-19 Oct 2018.
18. A. Torrisi, P. W. Wachulak, H. Fiedorowicz and L. Torrisi, "Monitoring of the Plasma Generated by a Gas-Puff Target Source Dedicated for SXR/EUV Microscopy", CHANNELING 2018, Ischia, Italy, 23-28 September 2018 - TALK
19. M. Cutroneo, L. Torrisi, A. Torrisi, J. Badziak, M. Rosinsky, A. Mackowa, P. Malinsky, Z. Sofer and R. Battger, "Hybrid Graphene Based Material Promising Target in Laser Matter Interaction", CHANNELING 2018, Ischia, Italy, 23-28 September 2018
20. L. Torrisi, A. Italiano, M. A. Mastelloni, A. Torrisi and M. Cutroneo "New and old fragments of architectural ceramic structures of the VI cent. BC from the Archaeological Museum "Bernabo' Brea"(Lipari): an XRF analysis", E-MRS 2018, Strasbourg, France, 18-22 June 2018
21. L. Torrisi, A. Italiano, M. A. Mastelloni, A. Torrisi and M. Cutroneo "New and old fragments of architectural ceramic structures of the VI cent. BC from the Archaeological Museum "Bernabo' Brea"(Lipari): an XRF analysis", E-MRS2018, Strasbourg, France, 18-22 June 2018
22. A. Torrisi, P. Wachulak, A. Bartnik and H. Fiedorowicz, L. Torrisi and M. Coreno "Feasibility of a gas-puff target source dedicated for XUV plasma generation", XTRAM 2017, Erice, Italy, 24-28 July 2017 - POSTER
23. A. Torrisi, P. Wachulak, A. Bartnik, Ł. Węgrzyński, T. Fok and H. Fiedorowicz, "Development and optimization of a "water window" microscope based on a gas-puff target laser-produced plasma source", Plasma Physics by Laser and Applications, 8<sup>th</sup> PPLA 2017, University of Messina, Messina, Italy, 5-7 July 2017 - TALK

24. P. W. Wachulak, A. Torrisi, A. Bartnik, Ł. Wegrzynski, T. Fok and H. Fiedorowicz, "Mikroskop pracujący w zakresie „okna wodnego” z rozdzielczością 60 nm na bazie laserowo-plazmowego źródła SXR i jego przykładowe aplikacje", XI sympozjum Techniki Laserowej (Laser Technology Symposium), Jastarnia, Poland, 27-30 September 2016
25. H. Fiedorowicz, A. Bartnik, P. Wachulak, R. Jarocki, J. Kostecki, M. Szczurek, D. Adjei, I. Ul Ahad, M. Ayele, T. Fok, I. Saber, A. Szczurek, T. Fok, A. Torrisi and Ł. Wegrzynski, "Laserowo-plazmowe źródła miękkiego promieniowania rentgenowskiego i skrajnego nadfioletu (EUV) do zastosowań w nauce i technologii", XI sympozjum Techniki Laserowej (Laser Technology Symposium), Jastarnia, Poland, 27-30 September 2016
26. P. W. Wachulak, A. Bartnik, A. Torrisi, Ł. Wegrzynski, T. Fok and H. Fiedorowicz, "Extreme Ultraviolet and soft X-ray microscopes with nanometer spatial resolution based on laser-plasma sources and their applications". COST Action MP1302 Nanospectroscopy, Joint MC and WG Meeting and Topical Meeting on Nanoparticles, Military University of Technology, Warsaw, 13-16 September 2016
27. A. Torrisi, P. Wachulak, A. Bartnik, Ł. Wegrzynski, T. Fok and H. Fiedorowicz, "Recent developments in table-top SXR/EUV microscopy using compact gas-puff target sources"- XRM 2016, Oxford (UK), 15-19 August 2016 – POSTER
28. A. Torrisi, P.W. Wachulak, A. Bartnik, Ł. Węgrzyński, T. Fok and H. Fiedorowicz, "Development of EUV and SXR nanoscale imaging systems based on double stream gas puff target sources"- ISSRNS 2016, Ustron (PL), 13-18 June 2016 - TALK
29. A. Torrisi, P. W. Wachulak, M. F. Nawaz, H. Fiedorowicz and L. Pina, "Characterization and optimization of SXR and EUV nanoscale imaging microscopy based on double stream gas-puff target sources", EXTATIC 2016 Welcome Week Workshop, Southampton, United Kingdom, 11th-15th January, 2016 – TALK
30. P. Wachulak, A. Torrisi, L. Wegrzynski, A. Bartnik, T. Fok and H. Fiedorowicz, "Soft X-ray compact microscope based on a double stream gas puff target source and applications", XFEL Users Meeting 2016, DESY Hamburg (Germany), 27th-29th January, 2016
31. P.W. Wachulak, A. Bartnik, A. Torrisi, L. Wegrzynski, T. Fok, J. Kostecki, R. Jarocki, A. Szczurek, M. Szczurek, D. Adjei, M. G. Ayele, I. Saber and H. Fiedorowicz, "Desk-top soft X-ray microscopy based on compact laser plasma X-ray sources", LASERLAB-EUROPE III Joint JRA Meeting, Milan, Italy, 23th-25th November, 2015
32. A. Torrisi, P. W. Wachulak, Š. Vondrová, J. Turňová, A. Bartnik, L. Wegrzynski and H. Fiedorowicz, "SXR and EUV nanoscale imaging microscopy using a compact gas puff target source: Acquisition parameters optimization", PPLA 2015, Frascati, Italy, 5th-7th October, 2015 - TALK
33. P. W. Wachulak, A. Torrisi, M. F. Nawaz, Š. Vondrová, J. Turňová, A. Bartnik, D. Adjei, L. Wegrzynski, T. Fok and H. Fiedorowicz, "Desk-top "Water Window" microscope based on LPP gas puff target source and its applications", PPLA 2015, Frascati, Italy, 5th-7th October, 2015
34. M. Rosinski, J. Badziak, P. Parys, A. Zaras-Szydlowska, L. Torrisi, L. Ryc, A. Szydlowski, A. Malinowska, B. Kaczmarczyk, J. Makowski and A. Torrisi, "Acceleration of protons in plasma produced from a thin plastic or aluminium target by a femtosecond laser", PPLA 2015, Frascati, Italy, 5th-7th October, 2015
35. L. Torrisi, J. Badziak, M. Rosinski, A. Zaras-Szydlowska and A. Torrisi, "Resonant absorption effect induced by polarized laser light irradiating thin foils in the TNSA regime of ion acceleration", PPLA 2015, Frascati, Italy, 5th-7th October, 2015

36. A. Zaráś-Szydłowska, J. Badziak, M. Rosiński, L. Torrisi, B. Kaczmarczyk, J. Makowski, P. Parys, L. Ryć and A. Torrisi, "Proton beams produced by a high-intensity femtosecond laser pulse from thin foils and massive targets – a comparison", PPLA 2015, Frascati, Italy, 5th-7th October, 2015
37. H. Fiedorowicz, A. Bartnik, P.W. Wachulak, R. Jarocki, J. Kostecki, M. Szczurek, D. Adjei, I.U. Ahad, M.G. Ayele, T. Fok, A. Szczurek, A. Torrisi and Ł. Węgrzyński, "Laser plasma sources of soft X-rays and extreme ultraviolet (EUV) for application in technology and science" 10th International Conference on Processes in Isotopes and Molecules, Cluj-Napoca, Romania, 23th-25th September 2015
38. A. Torrisi, P. Wachulak, A. Bartnik, J. Kostecki, L. Wegrzynski, R. Jarocki, M. Szczurek and H. Fiedorowicz and L. Torrisi, "Plasma characterization of the gas puff target source dedicated for soft X-ray microscopy", PLASMA 2015, Warsaw, Poland, 7h-11hh September, 2015 - POSTER
39. M. Rosiński, J. Badziak, L. Torrisi, B. Kaczmarczyk, J. Makowski, P. Parys, L. Ryć, A. Torrisi and A. Zaráś-Szydłowska, "Acceleration of protons in plasma produced from a thin plastic or aluminium target by a femtosecond laser", PLASMA2015, Warsaw (Poland), 7th-11th September, 2015
40. A. Zaráś-Szydłowska, J. Badziak, M. Rosiński, L. Torrisi, B. Kaczmarczyk, J. Makowski, P. Parys, L. Ryć and A. Torrisi, "A comparison of properties of proton beams produced by a femtosecond laser pulse from thin foils and massive targets", PLASMA2015, Warsaw (Poland), 7th-11th September, 2015
41. L. Torrisi, L. Calcagno, M. Cutroneo, J. Badziak, M. Rosinski, A. Zaras, Szydlowska and A. Torrisi, "Nanostructured targets for TNSA laser ion acceleration", PLASMA2015, Warsaw (Poland), 7th-11th September, 2015
42. H. Fiedorowicz, A. Bartnik, P.W. Wachulak, R. Jarocki, J. Kostecki, M. Szczurek, D. Adjei, I.U. Ahad, M.G. Ayele, T. Fok, A. Szczurek, A. Torrisi and Ł. Węgrzyński, "Laboratory sources of soft X-rays and extreme ultraviolet (EUV) based on laser plasmas produced with a gas puff target" XI Krajowe Sympozjum Użytkowników Promieniowania Synchrotronowego, Chorzów, 1st-4<sup>th</sup> September, 2015
43. A. Torrisi, P. Wachulak, M. Fahad Nawaz, A. Bartnik, J. Kostecki, Ł. Wegrzynski, R. Jarocki, M. Szczurek and H. Fiedorowicz, "Optimization of a „water window” microscope based on a compact laser plasma SXR source", Multinational Congress on Microscopy MCM 2015, Eger, Hungary, 23th-28th August 2015 - TALK
44. M. Fahad Nawaz, A. Jancarek, M. Nevrkla, P. Wachulak and A. Torrisi, "Development of a compact water-window microscope for high resolution imaging of biological objects, based on capillary discharge XUV source", Multinational Congress on Microscopy MCM 2015, Eger, Hungary, 23th-28th August 2015
45. P. Wachulak, A. Torrisi, M. F. Nawaz, Š. Vondrová, J. Turňová, A. Bartnik, D. Adjei, J. Kostecki, L. Wegrzynski, T. Fok, R. Jarocki, M. Szczurek, H. Fiedorowicz, Z. Zápražný, D. Korytár and A. Jancarek, "Imaging techniques using laser plasma soft X-ray and EUV sources", 1<sup>st</sup> Workshop on Application of Laser Plasma Sources of X-rays and Extreme Ultraviolet (EUV) in Technology and Science – ALPS 2015, Warsaw, Poland, 6th-9th July 2015
46. A. Torrisi, P. Wachulak, M. F. Nawaz, A. Bartnik, D. Adjei, J. Kostecki, L. Wegrzynski, R. Jarocki, M. Szczurek and H. Fiedorowicz, "Development and optimization of a compact "water window" microscope using a SXR gas puff target source", 1<sup>st</sup> Workshop on Application of Laser Plasma Sources of X-rays and Extreme Ultraviolet (EUV) in Technology and Science – ALPS 2015, Warsaw, Poland, 6th-9th July 2015 - TALK
47. A. Bartnik, P. Wachulak, R. Jarocki, J. Kostecki, M. Szczurek, D. Adjei, I. UI Ahad, M. G. Ayele, T. Fok, A. Szczurek, A. Torrisi, Ł. Węgrzyński and H. Fiedorowicz, "Laser plasma sources of soft X-rays and extreme ultraviolet (EUV) based on a gas puff target", 1<sup>st</sup> Workshop on Application of Laser Plasma Sources of X-rays and Extreme Ultraviolet (EUV) in Technology and Science – ALPS 2015, Warsaw, Poland, 6th-9th July 2015



48. A. Torrisi, P. Wachulak, M.F. Nawaz, A. Bartnik, D. Adjei, S. Vondrova, J. Turnova, A. Jancarek and H. Fiedorowicz, "Application of a compact "water window" sources for investigations of nanostructures using SXR microscope", 50th Zakopane School of Physics: Breaking Frontiers: Submicron Structures in Physics and Biology, Zakopane, Poland, 18th-23th May, 2015 - POSTER
49. L. Torrisi, M. Cutroneo, A. Italiano and A. Torrisi, "Analysis of Elements, Compounds and Isotopes in ancient bronze coins of the Mediterranean basin", TECHNART2015, Catania, Italy, 27th-30th April, 2015
50. P. Wachulak, A. Torrisi, A. Bartnik, D. Adjei, J. Kostecki, L. Wegrzynski, T. Fok, R. Jarocki, M. Szczurek and H. Fiedorowicz, "A compact "water-window" microscope with 60nm spatial resolution based on a double stream gas-puff target and Fresnel zone plate optics", SPIE 2015 Optics + Optoelectronics, Prague, Czech Republic, 13th-16th April, 2015
51. A. Torrisi, P. Wachulak, F. Nawaz, A. Bartnik, D. Adjei, J. Kostecki, L. Wegrzynski, R. Jarocki, M. Szczurek and H. Fiedorowicz, "Nanoscale imaging using a compact "water window" SXR microscope – signal to noise ratio measurements for optimization of acquisition parameters", SPIE 2015 Optics + Optoelectronics, Prague, Czech Republic, 13th-16th April, 2015 - TALK
52. H. Fiedorowicz, A. Bartnik, R. Jarocki, J. Kostecki, M. Szczurek, P. W. Wachulak, D. Adjei, I. U. Ahad, M. G. Ayele, T. Fok, A. Torrisi and L. Wegrzynski, "Laser plasma sources of soft X-rays and extreme ultraviolet (EUV) for application in science and technology", SPIE 2015 Optics + Optoelectronics, Prague, Czech Republic, 13th-16th April, 2015
53. P. Wachulak, A. Torrisi, A. Bartnik, D. Adjei, J. Kostecki, L. Wegrzynski, R. Jarocki, M. Szczurek and H. Fiedorowicz, "60-nm spatial resolution water window microscope based on a double stream gas puff target SXR source", DESY Photon Science Users' Meeting and European XFEL User's Meeting 2015, Hamburg, Germany, January 28th-30th, 2015
54. A. Torrisi, P. Wachulak, H. Fiedorowicz and L. Pina, "Nanoscale imaging using compact laser plasma SXR sources based on a double stream gas puff target and Fresnel optics", EXTATIC 2014 Welcome Week Workshop, Warsaw, Poland, 20th-24th October, 2014 - TALK
55. H. Fiedorowicz, A. Bartnik, R. Jarocki, J. Kostecki, M. Szczurek, P. W. Wachulak, D. Adjei, I. U. Ahad, M. G. Ayele, T. Fok, A. Szczurek, A. Torrisi and Ł. Węgrzyński, "Laser plasma sources of soft X-rays and extreme ultraviolet (EUV) for application in science and technology", EXTATIC 2014 Welcome Week Workshop, Warsaw, Poland, 20th-24th October, 2014
56. L. Torrisi, M. Cutroneo, A. Italiano and A. Torrisi, "Analisi di elementi, composti ed isotopi in antiche monete bronzee dell'Area del Mediterraneo", SIF 2014, Pisa (Italy), 22nd-26th September, 2014
57. M. Cutroneo, L. Torrisi, A. M. Visco and A. Torrisi, "Investigation of Optical Properties of Hydrogenated targets for proton acceleration by plasma-laser", XI Congress on Bioengineering, Engineering Dept. of the University of Messina (Italy), 5th July, 2013
58. M. Cutroneo, L. Torrisi, L. Calcagno, A. Torrisi and A.M. Visco, "Optical absorption measurements in targets for laser proton production", XII AIV Conference, Catania, Italy, 15th-17 th May, 2013
59. L. Torrisi, G. Mondio, A.M. Mezzasalma, F. Caridi, L. Giuffrida, T. Serafino, F. Di Bartolo, A. Baglione and A. Torrisi, "Laser ablation coupled to mass quadrupole spectrometry (LAMQS) applied to ancient coins", II Workshop on Plasma, Sources, Biophysics and Applications Dept. of Physics of the University of Messina (Italy), 26th October, 2010
60. A. Torrisi, L. Giuffrida, F. Caridi, T. Serafino, E.D. Castrizio, G. Mondio and L. Torrisi, "Laser Ablation Coupled to Mass Quadrupole Spectrometry (LAMQS) applied to the Cultural Heritage", YOCOCU 2010, Palermo, Italy (CNR – ISMN), 24th - 26th May, 2010 - TALK

**REPORTS:**

1. L. Torrisi, M. Cutroneo, G. Ceccio, A. Cannavò, N. Restuccia, G. Costa, L. Calcagno, I. Paterniti, C. Marchetta and A. Torrisi, "Nanoparticles by laser and their applications in Nuclear Physics", Activity Report Laboratori Nazionali del Sud (LNS) 2015-2016, pp. 213-234.

**SEMINARS:**

1. A. Torrisi, "SXR and EUV nanoscale imaging using compact laser plasma sources based on a double stream gas-puff target and Fresnel optics", Nuclear Physics Institute, ASCR – Rež (Czech Republic) - May 4th 2017.

**PRESS RELEATED ARTICLES:**

1. European Microscopy Society, Yearbook 2015, Page 71

Data

Luogo