

**LASER APPLICATIONS IN CULTURAL HERITAGE SCIENCE & CONSERVATION****LIST OF PUBLICATIONS**

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**ARTICLES IN SCIENTIFIC JOURNALS**

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1. "POLYGNOSIS": The development of a Thesaurus in an Educational Web Platform on optical and laser-based investigation methods for Cultural Heritage analysis and diagnosis", N. Platia, M. Chatzidakis, C. Doerr, L. Charami, Ch. Bekiari, K. Melessanaki, K. Hatzigiannakis, P. Pouli, Heritage Science (2017) 5:50; doi:[10.1186/s40494-017-0163-0](https://doi.org/10.1186/s40494-017-0163-0)
2. "A method for the registration of spectral images of paintings and its evaluation", A. Zacharopoulos, K. Hatzigiannakis, P. Karamaoynas, V. M. Papadakis, M. Andrianakis, K. Melessanaki, X. Zabulis, Journal of Cultural Heritage (2017); doi:[10.1016/j.culher.2017.07.004](https://doi.org/10.1016/j.culher.2017.07.004).
3. "Photoacoustic imaging reveals hidden underdrawings in paintings", G.J. Tsevelakis, I. Vrovaki, P. Siozos, K. Melessanaki, K. Hatzigiannakis, C. Fotakis, G. Zacharakis, Scientific RepoRts, 7: 747 (2017); doi:[10.1038/s41598-017-00873-7](https://doi.org/10.1038/s41598-017-00873-7).
4. "Complimentarity of digital holographic speckle pattern interferometry and simulated infrared thermography for Cultural Heritage structural diagnostic research", V. Tornari, M. Andrianakis, K. Hatzigiannakis, K. Kosma, V. Detalle, E. Bourguignon, D. Giovannacci, D. Brissaud, International Journal of Engineering Research & Science ,2, 11, 2395-6992 (2016),
5. "Preventive deformation measurements on cultural heritage materials based on non-contact surface response of model samples", V. Tornari, E. Bernikola, N. Tsigarida, M. Andriannakis, K. Hatzigiannakis, J. Leissner, Studies in Conservation, 60 (S1), S143-158 (2015); doi:[10.1179/0039363015Z.000000000219](https://doi.org/10.1179/0039363015Z.000000000219).
6. "Synchronized deformation monitoring in laser cleaning: an application for Cultural Heritage conservation" V. Tornari, E. Bernikola, K. Hatzigiannakis, K. Melessanaki, P. Pouli, Universal Journal of Physics and Application 1(2): 149-159, (2013); doi:[10.13189/ujpa.2013.010215](https://doi.org/10.13189/ujpa.2013.010215).
7. "Micro-mapping of defect structural micro-morphology in the documentation of fresco wallpaintings", V. Tornari, E. Bernikola, E. Tsiranidou, K. Hatzigiannakis, M. Andrianakis, V. Detalle, J.L. Bodnar, International journal of heritage in the digital era, 2 (1) (2013); doi: [10.1260/2047-4970.2.1.1](https://doi.org/10.1260/2047-4970.2.1.1).

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**INVITED CHAPTERS IN BOOKS**

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1. "Laser Tools in Archaeology and Conservation. How Far Can We Get?" A. Philippidis, P. Siozos, Z.E. Papiakia, K. Melessanaki, K. Hatzigiannakis, M. Vakondiou, G. Manganas, K. Diamanti, A. Giakoumaki, D. Anglos, Chapter in "Best Practices of Geoinformatic Technologies for the Mapping of Archaeolandscapes" A. Sarris (Ed.), Archaeopress Publishing Ltd, Oxford, .pp. 261-269 (2015) <http://www.archaeopress.com/Public/displayProductDetail.asp?id={A29B6318-83A5-4B36-BF5B-50B1EFA29AB9}> ISBN 9781784911621

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**CONFERENCE PROCEEDINGS**

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1. "The contribution of geophysical and spectral imaging techniques in the archaeological investigations of Minoan Koumasa", A. Sarris, Kostas K. Hatzigiannakis, D. Panagiotopoulos, 15th International Conference on Archaeological Prospection March 28-April 1, 2023, Kiel,Germany. [10.38072/978-3-928794-83-1/p47](https://doi.org/10.38072/978-3-928794-83-1/p47)

2. “Monitoring and mapping of deterioration products on cultural heritage monuments using imaging and laser spectroscopy”, K. Hatzigiannakis, K. Melessanaki, A. Philippidis, O. Kokkinaki, E. Kalokairinou, P. Siozos, P. Pouli, E. Politaki, A. Psaroudaki, A. Dokoumetzidis, E. Katsaveli, E. Kavoulaki and V. Sithiakaki, Proceedings of the 1st International Conference TMM-CH “Transdisciplinary Multispectral Modelling and Cooperation for the Preservation of Cultural Heritage”, 10-13 October, 2018 Athens, Greece In: Moropoulou A., Korres M., Georgopoulos A., Spyrakos C., Mouzakis C. (eds) Transdisciplinary Multispectral Modeling and Cooperation for the Preservation of Cultural Heritage. TMM\_CH 2018. Communications in Computer and Information Science, vol 962. Springer, Cham. [https://link.springer.com/chapter/10.1007%2F978-3-030-12960-6\\_29](https://link.springer.com/chapter/10.1007%2F978-3-030-12960-6_29)
3. Studies on Azulejo glaze welding by means of laser irradiation, Sílvia R. M. Pereira, Kostas Hatzigiannakis, Eleni Polychronaki, Kristallia Melessanaki, Paraskevi Pouli, João M. Mimoso, GlazeArt2018, International Conference Glazed Ceramics in Cultural Heritage, Lisbon, October 29-30, 2018, <http://glazeart2018.inec.pt/>
4. “Surface reaction under climate impact: A direct holographic visualization of assumed processes”, V. Tornari, E. Bernikola, K. Hatzigiannakis, M. Andriannakis, P. Bellendorf, C. Bertolin, D. Camuffo, L. Kotova, D. Jacobs, J. Leissner, FRINGE 2013, The 7th International Workshop on Advanced Optical Imaging and Metrology, 8-11/09/2013, Germany; [doi:10.1007/978-3-642-36359-7\\_177](https://doi.org/10.1007/978-3-642-36359-7_177).
5. “Real-time monitoring of laser assisted removal of shellac from wooden artefacts using Digital Holographic Speckle Pattern Interferometry” E. Bernikola, K. Melessanaki, K. Hatzigiannakis, P. Pouli and V. Tornari, Lasers in the Conservation of Artworks, eds D. Saunders, M. Strlic, C. Korenberg, N. Luxford and K. Birkholzer, Archetype publications Ltd, London, 52-59 (2013).
6. “A new portable Digital Holographic Speckle Pattern Interferometry system for artworks structural documentation”, Kostas Hatzigiannakis, Eirini Bernikola, Vivi Tornari, Lasers in the Conservation of Artworks - LACONA IX proceedings, eds D. Saunders, M. Strlic, C. Korenberg, N. Luxford and K. Birkholzer, Archetype publications Ltd, London, 210-212 (2013).

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#### In GREEK:

1. “Digital Speckle Pattern Interferometry portable system: Application in Optical Metrology and works of art”, K. Hatzigiannakis, M. Andriannakis, E. Bernikola, V. Tornari submitted in 4<sup>th</sup> National Conference of Metrology 2012 (In Greek).
2. The removal of surface deposits from the sculptures of Aiani archaeological Museum with laser irradiation M. Lykiardopoulou-Petrou, P. Pouli, in “The archaeological works in Ano Macedonia, 1, 2009”, Proceedings of the Symposium on “The archaeological and historic research in Ano Macedonia during the year 2009”, 187-201 (2011)(in Greek with English abstract), ISBN 978-960-214-993-5.
3. “Laser technology for the conservation of iron objects”, P. Pouli, Proc. “IRON” conservation colloquium organized by the Archaeological Museum of Thessaloniki, 63-76, 2009 (in Greek).
4. “Combination of ultraviolet and infrared laser pulses for sculpture cleaning: the application of this innovative methodology on the surface of the Acropolis monuments and sculptures”, P. Pouli, V. Zafiropoulos, Chapter 9 in: *Study on the restoration of the Parthenon, Volume 7: Study on the cleaning of the West Frieze*, Eds. The Greek Ministry of Culture and the Committee for the Conservation of the Acropolis Monuments, Athens 2002 (in Greek).
5. “Hermes of ancient Messene; Application of laser technology for the removal of sediments from white marble” Amerimni Galanou, Ioanna Dogani, Paraskevi Pouli, Archaeology and Arts (Αρχαιολογία και Τέχνες), 85B, 2001, pp 87-94 (in Greek with English abstract).

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### Conferences presentations

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1. "Evaluation of synergistic multi/hyper-spectral techniques for the non-invasive analytical characterization of large-size paintings by means of a 19th-century mock-up painting", K. Hatzigiannakis, K. Melessanaki, A. Moutsatsou, A. Terlix, E. Kavalieratou, K. Tsampa, E. Androulakaki, D. Anglos, A. G. Karydas, 3rd International Conference TMM-CH, Eugenides Foundation Athens, Greece, 20-23 March 2023
2. "Development of an Open-Access Laboratory for the analytical study and conservation of largescale artworks supported by advanced robotic and digital systems. The case of the PROTEAS project", C. Bekiari, D. Angelakis, K. Hatzigiannakis, K. Karakasiliotis, C. Stentoumis, X. Zabulis, A. Karydas, D. Anglos, Ef. Agathonikou and D. Plexousakis, in 3rd International Conference TMM-CH, Eugenides Foundation Athens, Greece, 20-23 March 2023. [\[link\]](#)
3. "Evaluation of the combined application of elemental and imaging spectroscopies for the non-invasive analytical characterization of 19th century paintings", K. Hatzigiannakis, K. Melessanaki, A. Moutsatsou, A. Terlix, E. Kavalieratou, K. Tsampa, E. Androulakaki, P. Assiouras, D. Anglos, A. G. Karydas, TECHNART 2023, Lisbon, 7-12 May 2023.
4. "Advanced spectroscopic and imaging tools with sophisticated robotics and digital repository systems for the analysis, conservation and documentation of oversized paintings in the framework of an Open Access Laboratory", K. Hatzigiannakis, A. G. Karydas, C. Bekiari, D. Angelakis, A. Terlix, K. Karakasiliotis, C. Stentoumis, X. Zabulis, D. Anglos, E. Agathonikou, D. Plexousakis,, IMA-2023, Chania, Crete, 17-20 September 2023. [\[link\]](#).

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### PATENTS

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**Restoration of vitreous surfaces using laser technology**, application submitted to Patent Cooperation Treaty (PCT) on 15 March 2016 and then to European Patent Office (EPO) on 15 October 2018.